Five Year Review Report

Second Five Year Review Report
for
Continental Steel Superfund Site
City of Kokomo
Howard County, Indiana

September 2007

PREPARED BY:

Indiana Department of Environmental Management
Indianapolis, Indiana

Approved by: **Date:**

Richard C Karl — 9-4-07

Richard Karl, Superfund Division Director
U.S. Environmental Protection Agency, Region V

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Thomas W. Easterly, Commissioner
Indiana Department of Environmental Management

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Richard Karl, Superfund Division Director
U.S. Environmental Protection Agency, Region V

FIVE YEAR REVIEW REPORT
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LIST OF ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
AST	Aboveground Storage Tank
BERA	Baseline Environmental Risk Assessment
BHHRA	Baseline Human Health Risk Assessment
CAMU	Corrective Action Management Unit (landfill)
CERCLA	Comprehensive Environmental Response, Compensation and Liabilities Act
CFR	Code of Federal Regulations
COPC	Contaminant of Potential Concern
CSSS	Continental Steel Superfund Site
U.S. EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
HQ	Hazard Quotient
HSVE	Heated Soil Vapor Extraction
IDEM	Indiana Department of Environmental Management
IRA	Interim Remedial Action
MCL	Maximum Contaminant Level
NCP	National Contingency Plan
NTCRA	Non-time Critical Removal Action
OUs	Operable Units
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Poly-Chlorinated biphenyls
SPM	State Project Manager
RA	Remedial Action
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RD/RA	Remedial Design/Remedial Action
RI	Remedial Investigation
ROD	Record of Decision
TCE	Trichloroethylene
TCRA	Time Critical Removal Action
UST	Underground Storage Tank
UU/UE	Unlimited Use/Unlimited Exposure
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The Continental Steel Superfund Site (CSSS) is located on West Markland Avenue in Kokomo, Howard County, Indiana. The total site covers approximately 183 acres and is comprised of six areas that were designated as Operable Units (OUs). The four source areas include:

- OU2, Acid Lagoon Area, a waste acid treatment and disposal facility,
- OU4, Markland Avenue Quarry Area, a waste disposal area,
- OU5, Main Plant, an abandoned steel manufacturing facility, and
- OU6, Slag Processing Area, a slag processing and disposal area.

The two receptor areas are:

- OU1, Site-wide Groundwater; and
- OU3, Wildcat and Kokomo creeks

Remedial Action has not started at OU1, OU2, OU4, and OU6.

The final Remedial Action (RA) is currently in the RA construction phase for OU3 and OU5.

The assessment of this five year review found that for OU3 U.S. EPA expects the remedy to be protective of human health and the environment once the remedy is implemented including implementing effective institutional controls which are maintained and monitored. In the interim, exposure pathways that could result in unacceptable risks are being controlled. A protectiveness statement for OU5 cannot be made at this time until further information is obtained. Information must be obtained for the Crushed Drum Area. Further information will be obtained by taking the following actions. Surface soil and debris piles will be sampled, and additional subsurface investigation will be performed as needed to confirm the presence or absence of underground storage tanks. It is expected that these actions will take approximately one year to complete, at which a protectiveness determination will be made.

FIVE YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site name (from WasteLAN): Continental Steel Superfund Site		
EPA ID (from WasteLAN):		
Region: V	**State:** IN	**City/County:** Kokomo/Howard
SITE STATUS		
NPL Status: x Final _ Deleted _ Other (specify)		
Remediation Status (choose all that apply): x_ Under Construction _ Operating _ Complete		
Multiple OUs? x YES _ NO	Construction completion date __/__/__	
Has site been put into reuse? _ YES x NO		
REVIEW STATUS		
Lead agency: __ U.S. EPA x State __ Tribe __ Other Federal Agency		
Author name: Pat Likins		
Author Title: Project Manager	**Author affiliation:** Indiana Department of Environmental Management	
Review period:** 09/4/2002 to 09/4/2007		
Date of site inspection: 04/15/2002		
Type of review: _x_ Post-SARA __Pre-SARA __NPL-Removal only __ Non-NPL Remedial Action Site _x_NPL State/Tribe-lead __ Regional Discretion		
Review number: _ 1 (first) _x_2 (second) __3 (third) __ Other (specify		
Triggering action: __ Actual RA on-site Construction at OU#__ __ Actual RA Start at OU# __ __ Construction Completion _x_ Previous Five Year Review Report __ Other (specify)		
Triggering action date (from WasteLAN): 09/4/2002		
Due Date (five years after triggering action date): 09/4/2007		

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five Year Review in WasteLAN.]

Issues

1. The City of Kokomo has announced a proposed reuse of the Continental Steel Superfund Site that is primarily recreational use. The remedial goals are designed to be protective for recreational use; however current institutional controls limit use of the area to industrial/commercial use. Since the cleanup goals in the implemented remedy are more conservative than the currently zoned use, this issue does not affect the protectiveness of the remedy.

2. Data indicates contamination from CSSS contributed to levels of PCBs in fish, and presents a direct contact risk to recreational users. A level-five (5) fish consumption advisory is in place for Kokomo and Wildcat Creeks, designating all fish from this stream unsafe for human consumption in any amount. Fish consumption advisory signs are posted. No physical barrier prevents access to the creeks. Kokomo Creek runs through Highland Park. Children and adults have been observed fishing in Kokomo Creek and Wildcat Creek.

3. Fences around the Acid Lagoon Area, the Slag Processing Area and the Markland Avenue Quarry Area are not intact. There is evidence of recent trespassing in the Acid Lagoon Area and the Slag Processing Area.

4. Full investigation of the Crushed Drum Area has never been funded. The City of Kokomo Parks Department has offices adjacent to this area and would like to acquire the area for use as a storage yard. The investigation needs to be completed; the necessity for action determined and any necessary RA should be completed.

5. Effective Institutional Controls for the Main Plant, Acid Lagoon Slag Processing Areas, and Markland Quarry Area must be implemented, monitored and maintained. Institutional Controls (land use restrictions) are components of the RAs for the Main Plant Area, Markland Quarry Area, Acid Lagoon Area and Slag Processing Area.

Recommendations and Follow-Up Actions

1. IDEM and U.S. EPA are coordinating with Kokomo/Howard County to maximize incorporation of re-use plans into the Remedial Design (RD). Kokomo/ Howard County may seek to change the zoning restrictions on the Main Plant if they acquire the property and wish to proceed with the recreational use plan.

2. Excavation will eliminate the risk of direct contact with creek sediment. However, levels of PCBs in fish are not expected to decrease enough to render fish edible for several years. Potential threats to human health through fish consumption are temporarily addressed by Fish Consumption Advisory signs. Further public education is advised. Signs in contaminated areas discourage consumption of fish.

3. Fence repairs to all of the site areas where necessary will be included in the RA. IDEM is funding and performing ongoing fence maintenance in the Main Plant area.

4. Further investigation of the Crushed Drum Area will be performed and a determination as to any action necessary.

5. IDEM must begin the process of implementing the land use restrictions. To that end, IDEM will perform an IC workplan including a study and will prepare the appropriate ICs to ensure any necessary restrictions on land use.

Protectiveness Statement(s):
OU 3, Wildcat and Kokomo creeks. U.S. EPA expects the remedy at OU 3 to be protective of human health and the environment once the remedy is implemented including implementing effective institutional controls which are maintained and monitored. In the interim, exposure pathways that could result in unacceptable risks are being controlled.

OU 5, Main Plant. A protectiveness statement for OU5 cannot be made at this time until further information is obtained. Information must be obtained for the Crushed Drum Area. Further information will be obtained by taking the following actions. Surface soil and debris piles will be sampled, and additional subsurface investigation will be performed as needed to confirm the presence or absence of underground storage tanks. It is expected that these actions will take approximately one year to complete, at which time a protectiveness determination will be made.

Continental Steel Superfund Site
Kokomo, Indiana
Second Five Year Review Report

I. Introduction

The purpose of this five year review is to determine whether the remedy at the Continental Steel Superfund Site (CSSS) is protective of human health and the environment. This report documents the methods, findings, and conclusions of the five year review. In addition, this five year review report identifies issues found during the review, and identifies recommendations to address them.

IDEM conducted the five year review of the remedy implemented at CSSS in Kokomo, Indiana. This review was conducted by the State Project Manager (SPM) for the entire site from February 2007 through May 2007.

This is the second five year review for CSSS. The triggering action for this statutory review is the signature date of the first five year review, September 4, 2002. The five year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for Unlimited Use and Unrestricted Exposure (UU/UE).

IDEM is preparing this five year review report pursuant to the Comprehensive Environmental Response, Compensation and Liabilities Act (CERCLA) Subsection 121 and the National Contingency Plan (NCP). CERCLA Subsection 121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

U.S. EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) 300.430(f)(4)(ii) that states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

II. Site Chronology

Table 1 - Chronology of Site Events

March, 1989	Based on preliminary investigations, Lagoon Area placed on the NPL. The Main Plant and the Markland Quarry were added shortly thereafter.
August 1989	U.S. EPA Technical Action Team inspected site for possible removal actions.
October 1989	IDEM contractor began removing, treating and disposing of pickle liquor from Lagoon Area. Lime-treated liquor was discharged to the Kokomo treatment plant.
February 1990	U.S. EPA began removing surface drums from Markland Avenue Quarry. U.S. EPA constructed a berm to inhibit off-site migration of contaminated water.
March 1990	U.S. EPA and IDEM inspected Main Plant for possible removal actions.
April 1990	U.S. EPA conducted an underwater investigation of Markland Avenue Quarry. U.S. EPA found roughly 1,000 drums and conducted sampling.
May 1990	U.S. EPA removed drums, tank contents, capacitors and transformers from Main Plant. Removed over 200 chemicals from metallurgical lab.
June 1990	IDEM contractor completed treatment and discharge of pickle liquor in Lagoon Area.
November 1990	IDEM conducted preliminary assessment of Dixon Road Quarry.
June 1991	U.S. EPA began removal of over 1,100 submerged drums from Markland Avenue Quarry Pond.
May 1992	U.S. EPA completed some TCRAS and conducted community interviews to develop a Community Relations Plan.
December 1992-February 1993	U.S. EPA removed an estimated 1350 buried drums and 1250 cubic yards of contaminated soil from the bank of Wildcat Creek at the Lagoon Area.
August 1993	U.S. EPA sampled Main Plant for PCBs, Polynuclear Aromatic Hydrocarbons (PAHs) asbestos, and lead; removed lead from buildings; consolidated and contained on site approximately 90 cubic yards of lead-contaminated dust; separated, stockpiled and covered hundreds of cubic yards of lead-contaminated debris for future disposal. Confirmed asbestos presence. U.S. EPA sampled sewers and drained acid from tank, disposed of acid off-site.
October 1993	U.S. EPA disposed off-site about 121 cubic yards of PCB contaminated soil excavated from western portion of Main Plant Area. U.S. EPA collected drums stored during the 1993 removal and later disposed off-site.
1993	IDEM completed Phase I of Remedial Investigation (RI). (Lagoon Area, Wildcat and Kokomo creeks, Site-wide Groundwater).

Fall 1994	U.S. EPA removed contents and cleaned Above Ground Storage Tanks (ASTs) in Main Plant. Tanks T-14 and T-15 emptied but not cleaned.
December 1994	IDEM reported one Trichlorethylene (TCE)-contaminated residential well to U.S. EPA.
March 1995	U.S. EPA installed an air stripper on the residential well.
1995	IDEM completed Phase II of RI (Markland Avenue Quarry, Main Plant, Slag Processing Area and data gaps from Phase I with regard to site-wide groundwater, the Lagoon Area and the creeks).
June 1996	Indiana State Department of Health performed environmental radiation surveys in Slag Processing Area, Lagoon Area, and the former laboratory area in the Main Plan. No evidence of gross radiological contamination.
September 1996	IDEM and U.S. EPA signed Interim ROD to decontaminate and demolish buildings in Main Plant Area.
July 1997	IDEM proposed removal of lead contaminated soils from residential yards east of the Main Plant.
April 1997	U.S. EPA Action Memorandum determined need to remove contaminated soils in residential area. IDEM presented Final Proposed Plan to the National Remedy Review Board.
February 1998 to March 1998	IDEM conducted first public comment period for the Final ROD for all six Operable Units.
April 1998 to May 1998	IDEM conducted second public comment period for final ROD for all six Operable Units.
May 5, 1998	IDEM began removal of residential soils.
September 1998	IDEM and U.S. EPA signed Final ROD for all six Operable Units.
December 1998	IDEM completed removal of lead contaminated residential soils.
April 1999	IDEM began decontamination and demolition of Main Plant buildings with asbestos survey.
December 28, 2000	IDEM completed decontamination and demolition of Main Plant buildings.
August 2001	U.S. EPA completed field investigative activities for RD.
July 2001	U.S. EPA completed Basis of Design plans for Slag Processing Area.
November 14, 2001	IDEM presented ESD at a Public Meeting.
December 14, 2001	Public comment period for ESD closes.
March 28, 2002	IDEM and U.S. EPA signed ESD.
April 2002	U.S. EPA contractor submitted Pre-final Basis of Design plans for Acid Lagoon Area (CAMU construction).
May 20-21, 2002	IDEM held community interviews for Five Year Review.

June 11, 2002	IDEM began weed control and fence maintenance in Main Plant Area.
June 13, 2002	IDEM held Public Availability Sessions for Five Year Review.
June 24, 2002	U.S. EPA completed repairs to residential soil pile in Slag Processing Area.
July 2002	U.S. EPA contractor submitted Preliminary Basis of Design plans for Main Plant Area.
March 27 until April 30, 2003	Public Comment Period for ROD Amendment. IDEM held a public meeting on March 27.
September 26, 2003	IDEM and U.S. EPA signed ROD Amendment.
December 2003	U.S. EPA completed Markland Quarry Final Cover RD.
February 4, 2004	U.S. EPA and IDEM investigated the potential for VOC vapors in the Markland Quarry Area to migrate from the groundwater to indoor air in nearby residences.
April 2004	U.S. EPA completed Sitewide Groundwater RDs.
May 2004	U.S. EPA completed Slag Processing Area final design.
November 2004	U.S. EPA completed Main Plant Final Cover RD.
August 15 until September 15, 2005	Public Comment Period for Explanation of Significant Differences. IDEM held Public Meeting on August 24.
September 30, 2005	IDEM and U.S. EPA signed Explanation of Significant Differences. Eliminated CAMU from the remedy and made other remedy changes.
January 2006	U.S. EPA completed Wildcat and Kokomo creeks sediment removal final RD.
April 2006	U.S. EPA completed Lagoon Area and Quarry Sediment Removal final RD.
March 28 until July 5, 2006	IDEM removed USTs and buried ACM from Main Plant Area.
January 16 to April 17, 2006	U.S. EPA constructed dewatering facility in Acid Lagoon Area.
December, 2006	U.S. EPA began pre-dredge sampling in Kokomo and Wildcat creeks.
June 20-24, 2005	IDEM and U.S. EPA conducted pretreatment sampling for Main Plant Final Cover.
August 28 to September 1, 2006	IDEM contractor conducted pretreatment sampling for Main Plant Final Cover.
November 27, 2006	IDEM contractor mobilized for construction of Main Plant Final Cover.
March 23, 2007	IDEM conducted public availability sessions for Five Year Review.
July, 2007	U.S. EPA performed a limited investigation of the Crushed Drum Area. U.S. EPA also removed large piles of slag and cinders from this area and transported the material to the Acid Lagoon Area.

III. Background

Physical Characteristics

The CSSS is located on West Markland Avenue in Kokomo, Howard County, Indiana. The total site covers approximately 183 acres and is comprised of six areas that were designated as Operable Units (OUs). The four source areas include:

- OU 2, Acid Lagoon Area, a waste acid treatment and disposal facility;
- OU 4, Markland Avenue Quarry Area, a waste disposal area;
- OU 5, Main Plant, an abandoned steel manufacturing facility; and
- OU 6, Slag Processing Area, a slag processing and disposal area.

The two receptor areas are:

- OU 1, Site-wide Groundwater; and
- OU 3, Wildcat and Kokomo creeks

Land and Resource Use

Continental Steel was built in 1914. The plant produced nails, wire, and wire fence from scrap metal. Operations included reheating, casting, rolling, drawing, pickling, annealing, hot-dip galvanizing, tinning, and oil tempering. The steel manufacturing operations at the plant included the use, handling, treatment, storage, and disposal of hazardous materials. Continental Steel operated from approximately 1914 to 1986. The company entered into bankruptcy and the site was abandoned in 1986. The area surrounding the facility is mixed residential, commercial, and industrial use and is zoned for general use, except for the Main Plant and Acid Lagoon Areas, which are zoned for industrial use.

History of Contamination

The Markland Avenue Quarry is a former limestone quarry purchased by Continental Steel in 1947 and used until the early 1980s for disposal of waste materials from processing operations. The 23-acre quarry area is bordered by Harrison Street, West Markland Avenue, Courtland Avenue, and Brandon Street. An open pond covers approximately four acres. Near-empty drums were taken to the quarry and remaining contents dumped onto the ground. A large portion of the quarry was backfilled with slag, refractory brick, pig iron, baghouse dust, and possibly drums. More than 400 drums, several tanks and other waste materials were scattered across the property. Drums contained mostly oils, solvents, and refuse. Some were disposed in the pond. Drums were removed from the pond in 1990 by U.S. EPA. The quarry is fenced and most of the ground surface is heavily vegetated.

The Main Plant is bordered by Kokomo Creek, West Markland Avenue, Leeds Street, Park Avenue, and extends west of Park Avenue to Wildcat Creek. The Main Plant included many buildings, underground sewers, and utility lines. More than 700 oil and solvent-filled drums, 55 aboveground and USTs and 33 vats, 24 electrical transformers, 200 capacitors, electric arc furnace dust (baghouse dust), and exposed asbestos were located throughout the Main Plant. Tanks and vats contained primarily oil and some chlorinated solvents and acids. A portion of the Main Plant

Area, south of Kokomo Creek, known as the Crushed Drum Area was investigated by means of an electro-magnetic survey during the RD. Anomalies were noted suggesting that one or more buried tanks may be in this location. The area was enclosed by an 8-foot chain link fence and locked in December 2000; however the fence and lock were damaged, possibly by crews who constructed a sewer lift station for the City of Kokomo. In 2007, U.S. EPA performed a limited investigation of the area and discovered large pieces of buried slag which may be the objects detected during the electro-magnetic survey. U.S. EPA also removed large piles of slag and cinders from this area and transported the material to the Acid Lagoon Area.

The Acid Lagoon Area is located approximately 0.3 miles west of the Main Plant along the south side of West Markland Avenue, bordered by Wildcat Creek, Markland Avenue and the City of Kokomo wastewater treatment facility. It covers approximately 56 acres and is composed of 10 lagoons that received spent pickling and finishing liquors from the Main Plant. The Acid Lagoon Area is fenced along the perimeter; however, there are gaps in the fence. The lagoons now retain surface water runoff from rainfall.

Slag generated from Continental Steel operations was processed and disposed in the nine-acre Slag Processing Area, approximately 0.2 miles west of the Acid Lagoon Area, bounded by West Markland Avenue, Wildcat Creek, and the Acid Lagoon Area. A portion of the Slag Processing Area was formerly known as the Chaffin Quarry, and may also have been used to dispose waste materials (i.e., drums) from the Main Plant. An abandoned railroad spur runs between the Slag Processing Area and the Acid Lagoon Area. An undetermined amount of slag was placed in this area. Slag processing refers to reclamation of metals from the slag. The slag consisted primarily of calcium and iron oxides with lesser amounts of aluminum, chromium, lead, manganese, magnesium, and zinc oxides. Currently the Slag Processing Area is unfenced and contains exposed slag. It contains a 50-foot high mound of slag in the west/northwest section, and a stockpile of lead-contaminated soil from the Residential Soil Removal Action. The soil stockpile was graded and seeded by U.S. EPA. Slag piles present no threat of airborne release of contaminants. Direct contact risk is to future residents and construction workers only.

Groundwater beneath CSSS appears to have received contaminants from the Main Plant, the Markland Avenue Quarry, the Acid Lagoon Area, and possibly from adjacent industrial facilities. Groundwater quality varies considerably, however, and contamination exists outside the source areas identified above.

Kokomo and Wildcat creeks run along the borders of the Main Plant and the Acid Lagoon Area. The Kokomo area is drained by these two creeks which are tributaries of the Wabash River. Kokomo Creek is generally 15 to 20 feet wide and less than 2 feet deep, and Wildcat Creek is generally 30 to 50 feet wide and approximately 2.5 to 5 feet deep. The creeks received water from the plant's wastewater recycling and filtration system, neutralized pickle liquor from the Acid Lagoon Area, discharge from site outfalls, and stormwater runoff from the site.

Initial Response

Interim RCRA Closure. IDEM performed the interim RCRA closure action in 1989, which involved neutralization of waste sulfuric acid stored in open lagoons in the Acid Lagoon Area.

Immediate Removal Actions. U.S. EPA began removal actions at the Main Plant and Markland Avenue Quarry in February 1990. U.S. EPA collected, staged, analyzed, and disposed of drums from these areas. U.S. EPA removed capacitors and transformers; analyzed and disposed of some tank liquids; removed seven USTs; removed various chemicals from a laboratory facility at the Main Plant; removed surface soil contaminated with PCBs from the former drum staging area at the quarry; over-packed, sampled, and disposed of surface drums; and constructed a berm. In May 1990, U.S. EPA staged and sampled drums at the Main Plant; collected and sampled tank contents; removed and disposed of the liquids; analyzed, and drained and disposed of capacitor and transformer oils. In August 1993, U.S. EPA sampled the Main Plant Area for PCBs, PAHs, asbestos and lead; and consolidated, containerized, and stored on-site approximately 90 cubic yards of lead-contaminated dust; removed lead from several buildings and separated, stockpiled and covered lead-contaminated debris for future disposal. U.S. EPA confirmed asbestos in the buildings; sampled sewers and drained and disposed acid from one tank. In October 1993, U.S. EPA excavated and disposed of one cubic yard of PCB-contaminated soil from the western portion of the Main Plant, and collected and disposed off-site various drums from previous removal efforts. In the fall of 1994 U.S. EPA removed contents and cleaned some above ground storage tanks, and emptied several others.

Interim RA - Decontamination and Demolition of Main Plant Buildings. IDEM investigated the Main Plant Area in 1995, and reported that the buildings presented a potential risk to nearby residents and trespassers. IDEM performed an Interim Risk Assessment/Feasibility Study for the Main Plant Buildings in 1996 and developed an Interim Proposed Plan that recommended the buildings be decontaminated and demolished. The proposed plan was presented to the public in March 1996, and signed in September 1996. Decontamination and Demolition of the Main Plant Buildings was the chosen alternative. The work began in April 1999 and was completed December 28, 2000. The remedy included:

- Gross removal of lead dust from building interiors with disposal of dust as hazardous waste in a permitted facility;
- Management and proper disposal of rinse water collected from decontamination;
- Abatement of exposed friable asbestos-containing material and asbestos-containing insulation by removal and disposal at a permitted facility;
- Sampling to confirm decontamination;
- Removal of PCB-contaminated wood block floors and disposal as hazardous waste;
- Demolition of all building superstructures, tanks, and equipment to grade, leaving floor slabs;
- Salvaging of structural steel as scrap unless it could be decontaminated and reused;
- Disposal of all debris and demolition rubble as hazardous, special or non-hazardous waste as determined by waste characterization;
- Use of water for dust control during demolition. Dust control water runoff would be contained and managed properly;

- Pumping out flooded basements, removal of equipment and residue;
- Filling or covering of pits and basements;
- Finishing of unpaved areas with crushed stone; and
- Securing of the site after the interim remedy was completed.

Non-Time Critical Removal Action - Residential Soil Removal Action. IDEM performed a NTCRA to address the threat to human health posed by lead-contaminated residential soils. The work began May 5, 1998, and concluded February 26, 1999. The NTCRA included excavation of contaminated surface soil and disposal in an off-site landfill. The total volume of material excavated from the off-site residential area was approximately 14,700 cubic yards. The components of this action were as follows:

- Removal of small shrubbery and yard equipment from the residential area of concern;
- Removal of lead contaminated surface soil to a depth of approximately one foot;
- On-site x-ray fluorescence testing of excavated surface soil samples for lead to determine limits of excavation;
- Laboratory confirmation sampling of approximately 20 percent of the surface soil samples (approximately 200);
- Backfill of excavations to grade with clean fill;
- Restoration of the site with sod and replacement of small shrubbery and yard equipment;
- Transportation of contaminated soil to an off-site landfill;
- Dust suppression measures including wetting down and covering exposed soils during transportation off-site as appropriate; and
- Preventative safety measures during construction activities to inhibit visitor intrusion onto the removal area.

Basis for Taking Action

IDEM and U.S. EPA determined that the CSSS poses potential long-term risks to human health and the environment by the presence of chemical constituents above the acceptable cancer risk range of $1x10^{-4}$ to $1x10^{-6}$, and above the non-cancer hazard risk quotient of one (1), that were established in the NCP, 40 CFR 300.430(e)(2)(i)(A)(2). This determination was documented in the ROD for CSSS, signed by IDEM and U.S. EPA on September 30, 1998. The contaminants and associated remediation goals for each OU of the site are listed in Tables 2 through 7 below.

Table 2 - Remediation Goals for Groundwater (OU1)

Chemical	Remediation Goals (ug/l)
Acrylonitrile	2
Arochlor-1242	0.5
Arochlor 1248	0.5
Arsenic	0.01 mg/l
1,1-dichloroethene	7
1,2-dichloroethene	70
Benzene	5
Manganese	50

Chloroform	100
Methylene Chloride	5
Perchloroethene (PCE)	5
Trichloroethene (TCE)	5
Vinyl Chloride	2

Table 3 - Remediation Goals for Acid Lagoon Area (OU2)

Chemical	Remediation Goals (ug/kg)
Benzo(a)anthracene	5,984
Benzo(a)pyrene	598
Benzo(b)flouranthene	5,984
Di-benz(a,h)anthracene	598
Indeno(1,2,3-c,d)pyrene	5,984
Arochlor-1242	1,000
Arochlor 1248	1,000
Beryllium	2,000
Lead	1,096,000

Table 4 - Remediation Goals for Sediment in Kokomo and Wildcat Creeks (OU3)

Chemical	Remediation Goals (ug/kg)
Benzo(a)pyrene	1,585
Benzo(b&k)flouranthene	1,361
Benzo(a)anthracene	1,853
Indeno(1,2.3-c,d)pyrene	930
Arsenic	19,000
Beryllium	840
Arochlor-1016	1,000
Arochlor 1242*	1,000*
Arochlor-1248*	1,000*
Arochlor-1254*	1,000*
Arochlor-1260	1,000

** IDEM and U.S. EPA incorporated a cleanup level for each individual Arochlor of 1ppm based upon the background. IDEM and U.S. EPA further determined that sediment excavation will be performed by excavating all polygons with PCBs greater than 3 times the remedial goal, and PAHs greater than 5 times the remedial goal.*

Table 5- Remediation Goals for Markland Quarry (OU4)

Chemical	Remediation Goals (ug/kg)
Benzo(a)anthracene	546
Benzo(a)pyrene	501
Benzo(b&k)flouranthene	779
Di-benz(a,h)anthracene	180
Indeno(1,2,3-c,d)pyrene	404
Arochlor-1248	1,000
Arsenic	19,000
Lead	400,000

Table 6 Remediation Goals for Soil at Main Plant (OU5)

Chemical	Remediation Goals (ug/kg)
Benzo(a)anthracene	13260
Benzo(a)pyrene	1330
Benzo(b&k)flouranthene	13260
Di-benz(a,h)anthracene	1330
Indeno(1,2,3-c,d)pyrene	13260
Arochlor-1242	4640
Arochlor-1248	4640
Arochlor-1254	2650
Arochlor-1260	4640
Lead	400,000
Total VOCs	1,000

Table 7 - Remediation Goals for Slag Processing Area (OU6)

Chemical	Remediation Goals (ug/kg)
Arsenic	19,000
Lead	400,000

There are no viable Potentially Responsible Parties, so the remedy is being funded by the Superfund Trust Fund through U.S. EPA with a 10% cost share being paid by the State of Indiana.

IV. Remedial Actions

Remedy Selection

The preferred RAs for the six Operable Units (OUs) of CSSS were presented to the public in a Proposed Plan in March 1997, and the RA selection was documented in the ROD signed by IDEM and U.S. EPA September 30, 1998. The Remedial Action Objectives are:

OU 1

- Prevent ingestion of shallow groundwater that contains contamination in excess of federal and state drinking water standards or criteria, or that poses a threat to human health.
- Restore groundwater to federal and state drinking water standards
- Prevent the migration of contamination that would result in continued degradation of site-wide groundwater or surface water to levels that exceed federal and state drinking water or water quality standards or criteria, or that poses a threat to human health or the environment, to the extent feasible and practical. For groundwater this goal will be addressed through source remediation, extraction and treatment of shallow groundwater, controlling the migration of intermediate and deep groundwater, and implementation of restrictive covenants to restrict groundwater use. A Technical Impracticability Waiver was granted due to the length of time necessary to attain drinking water standards in the intermediate and deep aquifers.

OU 2

- Prevent ingestion of shallow groundwater that contains contamination in excess of federal and state drinking water standards or criteria, or that poses a threat to human health.
- Restore groundwater to federal and state drinking water standards.
- Prevent incidental ingestion and direct contact with sludge, soil, and waste piles that contain contamination in excess of federal and state soil standards or criteria, or that pose a threat to human health.
- Prevent inhalation of airborne contaminants (from disturbed soil) that exceed federal and state air standards or criteria, or that pose a threat to human health.
- Prevent the migration of contamination that would result in continued degradation of site-wide groundwater or surface water to levels that exceed federal and state drinking water or water quality standards or criteria, or that poses a threat to human health or the environment, to the extent feasible and practical.

OU 3

- Prevent direct contact with contaminated sediment that exceeds federal and state standards or criteria, or that poses a threat to human health.
- Prevent ingestion of potentially contaminated fish from the creeks that may present a health risk.
- Prevent sediment impacts to ecological environment.
- Restore sediments to levels protective of human health and the environment, to the extent practical and feasible, while minimizing adverse impact to the wetlands from potential remedial activities, and minimizing the potential for sediment to become suspended in the surface water column.
- Prevent incidental ingestion and direct contact with surface water containing contamination that exceeds federal and state standards or criteria, or that poses a threat to human health.
- Prevent surface water impacts to the ecological environment.
- Prevent dermal contact with groundwater that contains contamination in excess of federal and state standards or criteria, or that poses a threat to human health.

OU 4

- Prevent ingestion of shallow groundwater that contains contamination in excess of federal and state drinking water standards or criteria, or that poses a threat to human health.
- Restore groundwater to federal and state drinking water standards
- Prevent incidental ingestion and direct contact with sludge, soil, and waste piles that contain contamination in excess of federal and state soil standards or criteria, or that pose a threat to human health.
- Prevent inhalation of airborne contaminants (from disturbed soil) that exceed federal and state air standards or criteria, or that pose a threat to human health.
- Prevent the migration of contamination that would result in continued degradation of site-wide groundwater or surface water to levels that exceed federal and state drinking water or water quality standards or criteria, or that poses a threat to human health or the environment, to the extent feasible and practical.
- Prevent direct contact with contaminated sediment that exceeds federal and state standards or criteria, or that poses a threat to human health.
- Prevent sediment impacts to ecological environment.

- Prevent incidental ingestion and direct contact with surface water containing contamination that exceeds federal and state standards or criteria, or that poses a threat to human health.

CU 5

- Prevent ingestion of shallow groundwater that contains contamination in excess of federal and state drinking water standards or criteria, or that poses a threat to human health.
- Restore groundwater to federal and state drinking water standards
- Prevent incidental ingestion and direct contact with sludge, soil, and waste piles that contain contamination in excess of federal and state soil standards or criteria, or that pose a threat to human health.
- Prevent inhalation of airborne contaminants (from disturbed soil) that exceed federal and state air standards or criteria, or that pose a threat to human health.
- Prevent the migration of contamination that would result in continued degradation of site-wide groundwater or surface water to levels that exceed federal and state drinking water or water quality standards or criteria, or that poses a threat to human health or the environment, to the extent feasible and practical.

CU 6

- Prevent ingestion of shallow groundwater that contains contamination in excess of federal and state drinking water standards or criteria, or that poses a threat to human health.
- Restore groundwater to federal and state drinking water standards
- Prevent incidental ingestion and direct contact with sludge, soil, and waste piles that contain contamination in excess of federal and state soil standards or criteria, or that pose a threat to human health.
- Prevent inhalation of airborne contaminants (from disturbed soil) that exceed federal and state air standards or criteria, or that pose a threat to human health.
- Prevent the migration of contamination that would result in continued degradation of site-wide groundwater or surface water to levels that exceed federal and state drinking water or water quality standards or criteria, or that poses a threat to human health or the environment, to the extent feasible and practical.

The RAs will include include:

- Excavation of contaminated soils and sediment;
- Disposal of contaminated soils and sediments in a permitted facility off site;
- Capping;
- Treatment in-situ of soil contaminated with volatile organic compounds (VOCs);
- Cover of acid storage and treatment lagoons and sludge drying beds;
- Institutional controls;
- Treatment of shallow and intermediate groundwater; and
- Monitored natural attenuation of contaminated groundwater in the deep aquifer.

Post ROD Decision Documents

- IDEM and U.S. EPA issued an ESD in 2001 to explain the increase in the cost of the IRA from the cost estimated in the Focused Feasibility Study.

- IDEM and U.S. EPA amended the ROD on September 26, 2003, to incorporate RA goals, incorporate a more stringent RA goal for PCBs in Kokomo and Wildcat Creeks based on background levels; and incorporate the new MCL for Arsenic as a groundwater cleanup goal.
- IDEM and U.S. EPA executed an Explanation of Significant Differences in September 2005, to describe significant differences to the 1998 remedy as follows:

Table 8 – Summary of Changes, Explanation of Significant Differences, September 2005

Elements Changed	Amended Remedy
Acid Lagoon Area (OU2)	
Excavate contaminated solids and consolidate on site in CAMU Collect and contain shallow groundwater with expanded interception trench system and dispose off site	Solids will not be consolidated on site. They will remain in place and a soil cover will be placed over the closed lagoons and surrounding area. Shallow groundwater will be extracted using wells, and the extracted water will be treated and discharged as appropriate.
Kokomo and Wildcat Creeks (OU3)	
Excavate PCB solids (sediment and bank soil) along Kokomo Creek and dispose on site in CAMU Elevated VOC solids removal and on site disposal	Creek solids (PCB and VOC solids) will be disposed off site at an existing permitted facility.
Markland Quarry Area (OU4)	
Dispose of Quarry sediment in Lagoon Area CAMU	Quarry sediment will be disposed off site at an existing permitted facility.
Main Plant Area (OU5)	
Elevated VOC solids removal and on site disposal in CAMU	Elevated VOC solids will be treated in place using Heated Soil Vapor Extraction.

Remedy Implementation

The final RAs for OU3 and OU5 are currently in the RA construction phase. Construction is underway for removal of contaminated sediment from Wildcat and Kokomo creeks and for Final Cover construction at the Main Plant Area. Construction for the other remedy elements will take place as funding permits.

Institutional Controls

Institutional Controls (ICs) are required to ensure the protectiveness of the remedy. ICs are non-engineered instruments, such as administrative and/or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. Implementation of

and compliance with ICs is required to assure long-term protectiveness for any areas which do not allow for Unlimited Use or Unrestricted Exposure (UU/UE).

The ROD requires ICs for the Acid Lagoon Area, the Slag Processing Area, the Main Plant Area, the Markland Quarry Area and the Site Wide Groundwater since it was anticipated that the remedy would not achieve unlimited use of those land areas and the cleanup standards for groundwater would not be achieved for some time.

Table 12 below identifies those areas that do not support UU/UE. The table below summarizes ICs for these restricted areas.

Table 9 – Institutional Controls

Media, Engineered Controls, & Areas that Do Not Support UU/UE Based on Current Conditions	**IC Objective**	**Title of Institutional Control Instrument Implement (note if planned)**
Groundwater	Prohibit groundwater use until cleanup standards are achieved.	Local ordinance (in effect, requires review to determine if it is effective as adopted)
Acid Lagoon Area	Prohibit residential or recreational use, require maintenance of cover and control excavation of contaminated media under the cover.	Restrictive Covenant (planned)
Main Plant Area	Prohibit residential use, require maintenance of cover and control excavation of contaminated media under the cover.	Restrictive Covenant (planned)
Markland Quarry Area	Prohibit residential or recreational use, require maintenance of cover and control excavation of contaminated media under the cover.	Restrictive Covenant (planned)
Slag Processing Area	Prohibit residential or recreational use, require maintenance of cover and control excavation of contaminated media under	Restrictive Covenant (planned)

	the cover.	
Wildcat and Kokomo Creeks	Prevent exposure to contaminated fish through consumption.	Fish Consumption Advisory (Level-Five Advisory is in place) Public education (planned)

Maps which depict the current conditions of the site and areas which do not allow for UU/UE will be developed as part of the implementation plan for the ICs. Planning and final construction details may also be coordinated with redevelopment plans to the extent feasible. As-built plans for completed construction must be available to provide the information necessary to place accurate Restrictive Covenants.

At this time, initial IC evaluation activities have determined that the required ICs have not been fully implemented. ICs currently in place include zoning restriction at the Acid Lagoon Area and the Main Plant Area limiting the use to industrial/commercial use. Additionally, other implemented ICs include 1) a local ordinance restricting groundwater use, and 2) a fish consumption advisory restricting use of Wildcat and Kokomo creeks. The local ordinance restricting use of groundwater in the area affected by the site was executed by the Kokomo Howard County Joint Council (City of Kokomo Zoning Ordinance, as amended by Ordinance No. 6375, May 9, 2005; Articles 1 through 11). For Wildcat and Kokomo creeks, a fish consumption advisory is in place.

Land use restrictions in the form of Restrictive Covenants are components of the RAs for the Main Plant Area, Acid Lagoon Area, Markland Quarry Area and Slag Processing Area. The intent of the planned ICs is to protect and require future maintenance of the engineering controls, primarily cover and vegetation; to restrict the use of contaminated groundwater; to ensure that any future excavation is performed with all appropriate precautions and proper material handling; and to ensure that future uses of the site are consistent with the cleanup levels.

Evaluating existing ICs and implementing and maintaining additional ICs will be required to assure protectiveness of the remedy. It is anticipated that an IC Plan which includes evaluating existing ICs and planning for implementation of ICs and long-term Site stewardship will be completed by U.S. EPA and IDEM. Evaluation activities include evaluating the current ordinance and fish consumption advisory for effectiveness. Also, along with implementing proprietary controls, IC evaluation activities will include performing title work to determine ownership and whether prior in-time encumbrances may interfere with the ICs, preparation of maps (paper and GIS), and implementing effective ICs as well as planning for long-term Site stewardship to assure proper maintenance and monitoring effective ICs.

Compliance with the stated objectives of the ICs was also evaluated during the five year review. Although no activities were observed that would have violated the institutional controls, there is evidence of trespassing. The parcels of property were abandoned by the former and current owners and are not being occupied or used. The current owner of the land which constitutes the Main Plant is Mr. Matthew Gentry. Mr. Gentry is not occupying or using the land for any purpose.

Most other areas of the site were owned by Continental Steel Corporation which became a bankrupt entity and abandoned the site. According to the property records at the Howard County Auditor's Office, Continental Steel Corporation remains the owner of record. Two parcels within the Acid Lagoon Area are owned by the City of Kokomo. Kokomo leased the land to Continental Steel but did not participate in or control the operations there. The City of Kokomo is not using or occupying the land in any way. Evidence of trespassing was observed in all but the Main Plant Area of the site. Fences around the Acid Lagoon Area and the Markland Avenue Quarry Area are not intact. The entrance to the Slag Processing Area restricts automobile or truck access. However, the temporary barrier has been moved several times by unknown persons who dumped waste material on the site. There is no fence to restrict access by foot or other means. There is evidence of recent trespassing in the Acid Lagoon Area, Markland Quarry Area and the Slag Processing Area.

No physical barrier restricts access to Kokomo and Wildcat creeks. It should be noted that the removal of sediments from Wildcat and Kokomo creeks, mobilized in April 2007 and scheduled for completion before the end of the 2007 calendar year, will eliminate direct contact risk to recreational users of the creeks and the level of contaminants in creek biota will decrease over time. The Fish Consumption Advisory currently in effect for the area will remain in place until data demonstrate that it can be reduced or lifted entirely. No other ICs are anticipated to be necessary for the creeks.

System Operations/Operation and Maintenance (O&M)

O&M will begin after the components of the RA have been constructed. Limited mowing of the Main Plant area during the growing season began after the demolition of the buildings. Regular mowing and inspection/repair of the cover on the Main Plant area will be necessary after completion of the final cover, scheduled for August of 2007. There are no O&M activities required by the interim RCRA closure, immediate removal actions, or the IRA.

V. Progress Since the last Five Year Review

Table 10 below presents the issues from the previous Five Year Review, and the progress and current status of those issues.

Table 10 – Progress Since the Last Five Year Review

Issues from Previous Review	Recommendations/Follow-up Actions	Party Respon-sible	Mile-stone Date	Action Taken and Outcome	Date of Action
1. Residential wells	Evaluation of groundwater data collected during the pre-design investigation and sampling of residential wells	IDEM/ U.S. EPA	12/30/ 02	Evaluation of groundwater data collected during the pre-design investigation and sampling of residential wells.	12/11/02
2. Evaluation of re-use, community participation in remedial design	IDEM and U.S. EPA will coordinate with Kokomo and their contractor, Strand Associates, Inc., to maximize incorporation of re-use plans into the RD. If a desired reuse requires a feasible change in designated land use for an area, IDEM will prepare an ESD.	IDEM/ U.S. EPA	6/30/ 03	IDEM prepared an ESD to incorporate cleanup goals for recreational use.	9\26\ 2003
3. Creek sediments, background wells	Sediment data was collected during the pre-design investigation, and the RA for Kokomo and Wildcat Creek sediments was re-evaluated. Updated background levels in Kokomo and Wildcat Creeks indicate the cleanup goal for PCBs should be reduced from five (5) parts per million (ppm) to one (1) ppm. The proposed cleanup goal will be presented in PP for a ROD Amendment.	IDEM/ U.S. EPA	12/30/ 02	The proposed cleanup goal was presented in PP for a ROD Amendment. The ROD was amended to incorporate the new cleanup goal.	9/26/ 2003

4. Creek sediments, exposure risks	Excavation will eliminate the risk of direct contact with creek sediment. However levels of PCBs in fish are not expected to decrease enough to render fish edible for several years. Potential threats to human health by fish consumption are temporarily being addressed by Fish Consumption Advisory signs. Further public education is advised.	IDEM/ U.S. EPA	6/30/ 03	IDEM presented information to the public about site contaminants and risks at public meetings on March 27, 2003 for the 2003 ESD; and August 24, 2003 for the 2005 ROD Amendment, and in the fact sheets that were distributed for those public meetings, and in meetings with the Wildcat Creek Guardians and students of I.U. Kokomo. Efforts to reach more community members are recommended.	3/27/03 8/24/05
5. Revised project implementa-tion strategy.	A PP for a ROD Amendment will be presented to the public for comment. This will incorporate the new RD/RA implementation strategy, all chemical-specific cleanup goals, and the new proposed cleanup goals for PCBs in Kokomo and Wildcat Creeks.	IDEM/ U.S. EPA	12/30/ 02	The ROD was amended.	9/26/ 2003
6. ROD Amendment to update COPCs	A PP for a ROD Amendment will be presented to the public for comment. This will incorporate the new RD/RA implementation strategy, all chemical-specific cleanup goals, and the new proposed cleanup goals for PCBs in Kokomo and Wildcat Creeks.	IDEM/ U.S. EPA	12/30/ 02	The ROD was amended.	9/26/ 2003
7. Fence repairs.	Fence repairs will be included in the RA. IDEM is funding and performing ongoing fence maintenance in the Main Plant Area.	IDEM/ U.S. EPA	10/30/ 02	IDEM repaired the Main Plant fence on two occasions. RAs that will include fence repairs have not begun.	12/11/03 2/17/03
8. Markland Quarry Area soil and groundwater	Further sampling of residential soil and indoor air and/or water sampling in nearby basements should be performed in the Markland Quarry Area.	IDEM/ U.S. EPA	12/30/ 02	U.S. EPA and IDEM investigated the potential for VOC vapors in the Markland Quarry Area to migrate from the groundwater to indoor air in nearby residences.	2/4/2004

Investigation accomplishments to date include:

- Investigation of the potential for VOC vapors in the Markland Quarry Area to migrate from the groundwater to indoor air in nearby residences;
- Pretreatment sampling in the VOC-contaminated area of the Main Plant;
- Investigation of the potential to use in-situ iron reduction technology to treat sediment in Markland Quarry;
- Investigation of certain storm sewers under the Main Plant with fluorescent dye to confirm they did not discharge to the Kokomo Wastewater Treatment Plant or to Wildcat or Kokomo Creeks; and
- Investigation of residential wells.

Construction accomplishments to date include:

- Completion of the dewatering facility in the Acid Lagoon Area that will be used for dewatering sediments from Kokomo and Wildcat Creeks;
- Pre-dredge sampling in Kokomo and Wildcat Creeks;
- Removal of USTs and Buried Asbestos-Containing Material at the Main Plant Area;
- Mobilization for removal of contaminated sediment from Wildcat and Kokomo creeks, including pre-dredge sampling; and
- Mobilization of Final Cover construction at the Main Plant Area, where work is in progress.

Construction elements projected for the future include:

OU1

- Institutional controls;
- Treatment of shallow and intermediate groundwater; and
- Monitored natural attenuation of contaminated groundwater in the deep aquifer;

OU2

- Excavation of contaminated soils and sediment;
- Disposal of contaminated soils and sediments in a permitted facility off site;
- Capping;
- Cover of acid storage and treatment lagoons and sludge drying beds; and
- Institutional controls;

OU3

- Excavation of contaminated soils and sediment; and
- Disposal of contaminated soils and sediments in a permitted facility off site;

OU4

- Excavation of contaminated soils and sediment;
- Disposal of contaminated soils and sediments in a permitted facility off site;
- Capping; and
- Institutional controls;

OU5

- Excavation of contaminated soils and sediment (VOC-contaminated soil area only, located southeast of the intersection of Markland Avenue and Park Avenue);
- Disposal of contaminated soils and sediments in a permitted facility off site (VOC-contaminated soil area only, located southeast of the intersection of Markland Avenue and Park Avenue);
- Capping (VOC-contaminated soil area located southeast of the intersection of Markland Avenue and Park Avenue, and along north bank of Kokomo Creek where creek sediment removal is ongoing); and
- Institutional controls;

OU6

- Capping;
- Institutional controls.

Institutional Controls:

- In response to the need to prevent exposure to contaminated groundwater, IDEM discussed institutional controls with representatives of local government agencies. As a result, a local ordinance restricting use of groundwater in the area affected by the site was executed by the Kokomo Howard County Joint Council (City of Kokomo Zoning Ordinance, as amended by Ordinance No. 6375, May 9, 2005; Articles 1 through 11).

Crushed Drum Area

- A portion of the Main Plant Area, south of Kokomo Creek, known as the Crushed Drum Area was investigated by means of an electro-magnetic survey during the RD. Anomalies were noted suggesting that one or more buried tanks may be in this location. In 2007, U.S. EPA performed a limited investigation of the area by excavating shallow test pits and discovered large pieces of buried slag which may be the material that was detected during the electro-magnetic survey. U.S. EPA also removed large piles of slag and cinders from this area and transported the material to the Acid Lagoon Area.

VI. Five Year Review Process

Administrative Components

IDEM notified members of the community were notified of the initiation of the five year review by fact sheets mailed on April 19, 2007, and distributed by email on April 10, 2007. The CSSS five year review team was led by Pat Likins of IDEM, SPM for CSSS, and included members from IDEM Science Services staff with expertise in hydrology, chemistry, and risk assessment. Mr. Nabil Fayoumi of U.S. EPA assisted in the review as representative for the support agency.

On March 20, 2007, the review team established the review schedule whose components included:

- Community Involvement;
- Document Review;

- Data Review;
- Site Inspection;
- Local Interviews; and
- Report Development and Review.

The schedule extended through May 30, 2007.

Community Notification and Involvement
IDEM initiated activities to involve the community in the five year review with a public availability session. IDEM published a public notice in two local newspapers, the Kokomo Tribune and the Kokomo Perspective, that a five year review was to be conducted and that there would be public availability sessions on April 23, 2007. IDEM sent fact sheets stating the same to community members, the Howard County Health Department, the Office of the Mayor of Kokomo, the County Commissioner's Office, and state and federal elected officials. The fact sheets invited the recipients to submit comments to IDEM.

During the public availability sessions and the interviews, members of the community asked questions about the ongoing RAs at the Main Plant (OU5) and Wildcat and Kokomo creeks (OU3), and viewed plans for OU1, OU2, OU4 and OU6. Two attendees expressed concerns that planned highway construction on US 31, approximately five miles east of the site, would disturb the RAs. IDEM received one complaint that the fact sheets were not received until after the public availability sessions. A full report of issues and information compiled from the interviews is presented in Attachment 4.

A notice will be sent to the same local newspapers that announcing that the five year review report for the CSSS is complete, and that the results of the review and the report are available to the public at the Kokomo/Howard County Public Library and IDEM office.

Document Review
This five year review consisted of a review of relevant documents including:

Markland Quarry Documents
- Report of Soil Gas and Indoor Air Sampling of the Residential Community Surrounding the Markland Avenue Quarry (Continental Steel), Dave Shekoski/CH2M HILL MKE, February 4, 2004;
- Bench Scale Test of Electrochemical Degradation of TCE in Quarry Water from Kokomo Continental Steel Superfund Site, James Fang and Souhail Al-Abed; EPA/ORD/NRMRL/ LRPCD/WMB; and
- Review of Data, Stephen L. Ostrodka, December 27, 2004.

Main Plant Area Documents
- Indiana State Department of Health Chemistry Laboratory, Preliminary Results, Sample Delivery Group 1946, July 8, 2005 and Sample Delivery Group 1948, July 20, 2005;

- US EPA Mobile Lab Final Report, Continental Steel, September 28, 2006;
- US EPA Region V ESD Central Regional Laboratory Data, Sample Delivery Group E2NW4, CERCLIS No. IND001213503, Case No. 35706, Continental Steel Corp (IN), October 20, 2006;
- VOC Remediation Area Soil Removal Sampling Report – Revised 2/18/07;
- Main Plant Bank Soil Screening Results January 22, 2007;
- EM-61 Survey, Imaging Subsurface, Inc., February 20, 2002;
- Report of Laboratory Analysis, Sierra Mobile Labs, Inc., January 12, 2007;
- Report of Analytical Services, Pace Analytical, Lab Project Number 5059049; and
- Report of Analytical Services, Pace Analytical, Lab Project Number 5058106.

Ground Water Documents

- Continental Steel ground water cleanup goals listed in the 2002 five year review;
- Ground Water Ordinance - City of Kokomo Zoning Ordinance, as amended by Ordinance No. 6375, May 9, 2005; Articles 1-11;
- Residential well data - February 20, 2003 data reports from IDEM to residents of:
  - 247 S. County Road 300 West;
  -1601 Stoneview Drive;
  -347 S. County Road 300 West;
  -1521 S. Dixon; and,
  -423 S. County Road 300 West.

Decision Documents

- Record of Decision Amendment, 2003; and
- Explanation of Significant Differences, 2005.

Final Remedial Design Documents

- Basis of Design, Sitewide Ground Water, April 2004;
- Basis of Design, Quarry Sediment Removal, April 2006;
- Basis of Design, Quarry Final Cover, December 2003;
- Basis of Design, Main Plant Final Cover, November 2004;
- Basis of Design, Kokomo and Wildcat Creeks, January 2006;
- Basis of Design, Lagoon Area, April 2006; and
- Basis of Design, Slag Processing Area, May 2004.

Data Review

Groundwater

The planned RA provides for groundwater monitoring at regular intervals. Sampling performed from May through August 2001 for the RD indicated horizontal and vertical extents of contamination in shallow, intermediate and deep groundwater consistent with those identified during the RI/FS. Sample results on the north-tending portion of contaminated groundwater near the Markland Quarry Area show that contamination extends into the residential area. Although

residences in the area are connected to the municipal water supply, the RI/FS did not identify if, or the extent to which, homes with basements are affected by contaminated groundwater. Only newly installed wells were sampled in 2001, therefore we do no have data to directly compare to the results of samples collected from wells during the RI/FS. Soil vapor investigations were performed in 2004 that did not identify any risks to residences in this area. The soil vapor investigations are discussed below.

Sampling of residential wells was identified as a follow up item in the 2002 five year review. The sampling was performed and results indicated that no contaminants were detected above primary MCLs in residential wells within or near the down gradient extent of the CSSS contaminated groundwater plume. One contaminant was detected above a secondary MCL in one residential well.

Surface Water and Sediment

Recent sampling, beginning in December 2006, of sediment from Kokomo and Wildcat Creeks was performed to provide updated information about the location and volume of the contaminated sediment. The level of contamination in the sediments of Kokomo and Wildcat Creeks remains elevated. Technical memoranda that provide a summary of the data and a revised Sediment Weighted Average Concentration (SWAC) analysis are included in Appendices C and D to this report.

U.S. EPA collected sediment samples in the Markland Quarry Area to determine the feasibility of using zero-valent iron to treat the sediment in-situ instead of excavating the sediment. Results indicated the sediment did exhibit the desired reactions in the laboratory, however no practical way of applying the technology could be developed for this situation that would reliably capture and treat VOCs in the quarry sediment and prevent migration to surrounding groundwater, therefore U.S. EPA and IDEM determined that excavation of the VOC contaminated sediment remains the most effective approach. U.S. EPA performed a second round of samples to confirm that the level of TCE in the sediment had not changed significantly over time. Results indicated the levels of TCE in the sediment remain significant.

Soil Gas and Indoor Air

In February 2004, U.S. EPA sampled soil gas and indoor air in the neighborhood near Markland Quarry to determine if site related VOCs that were detected in the shallow groundwater could be migrating into indoor air in nearby residences. Site related contaminants were not detected in indoor air above levels of concern in any homes sampled during the February 2004 event. Data from borings near the intersection of Brandon and Harrison Streets indicated TCE and Vinyl Chloride in soil gas at levels that indicated further investigation was advised in selected homes. U.S. EPA returned and collected indoor air samples from 6 homes. Data did not conclusively indicate site related contaminants in indoor air above levels of concern. Three homeowners agreed to have their homes retested. U.S. EPA hopes to schedule that resampling soon. The other homeowners did not respond to further contacts from IDEM staff.

Soil and Sludge

Soil borings in the Main Plant indicated that the VOC-contaminated area requiring treatment is approximately twice as large as previously estimated. Due to adjustments in the project schedule, it was determined that soil from the top two feet of the area demonstrated by data to be below the 1 part per billion (ppb) total VOC cleanup level would be excavated and placed in the consolidation area prior to treating the remaining soil. Post-treatment sampling will be performed on the entire area to confirm that the cleanup level was achieved. The remaining upper two feet of soil in the area will be sampled after Heated Soil Vapor Extraction (HSVE) to remove the VOCs, to determine if off-site disposal is necessary due to the presence of metals, PCBs or PAHs. Due to funding, the HSVE will not be performed as part of the Main Plant Final Cover construction. Therefore is will remain necessary to restrict access to those areas where VOC contamination remains in the soil near the surface.

The area along the south perimeter of the Main Plant contaminated with PCBs and lead was excavated in accordance with the ROD to the extent that land contours remained relatively flat, just north of the steep vertical north bank of Kokomo Creek. The bank is largely composed of fill material. Excavation in accordance with the design would result in destabilization of the bank. IDEM collected additional screening data using X-ray fluorescence that indicated lead levels are elevated in the bank outside the excavated area. U.S. EPA's contractor collected additional data for laboratory analysis. IDEM and U.S. EPA representatives conferred and agreed that excavation of the bank area would be performed as part of the Kokomo and Wildcat creeks sediment removal work that includes bank stabilization.

A small previously unidentified deposit of sludge and affected soil was encountered in the northeast quadrant of the Main Plant Area. IDEM sampled the material. Data indicated that it was non-detect for any RCRA metals, therefore the material was placed in the on-site consolidation area. Geographical Positioning System (GPS) location information was collected to identify where the material was encountered and placed.

Site Inspection

IDEM staff conducted inspections at the site on March 13 and 20, 2007; accompanied by the U.S. EPA RPM on March 13 and by the IDEM Site Chemist and Site Engineer on March 20. Since RA construction was not complete in any OU, the purpose of the inspections was to assess the conditions at each area, to evaluate site security, and to identify any conditions that would affect the protectiveness of the remedy. No systems are in place that collect data or require monitoring. Institutional Controls (ICs) were evaluated by reviewing the Title Search completed by IDEM on March 15, 2002, and the local zoning ordinance.

Site Inspection Procedures were as follows:

1. Tailgate safety briefing;
2. Inspect perimeter fence;
3. Walk through site area, identify any changed conditions, document conditions with digital photos;
4. Inspect monitoring wells; and

5. Observe and document changes in land use.

No repairs have been made to the fencing in the Acid Lagoon Area since the 2002 five year review report. At that time, the Acid Lagoon Area fence was found to be ineffective. The fence had been destroyed in a large area along the east perimeter (between the Acid Lagoon Area and the Kokomo Municipal Wastewater Treatment facility). Heavy debris is causing the fence to lean along the south perimeter of the property at the northeast corner of the Acid Lagoon Area. (The adjoining property is part of the Kokomo wastewater treatment plant). Fence damage also exists along the west perimeter. Although fence repairs had been made to the Markland Quarry after the 2002 five year review, IDEM staff observed one large new gap in the fence along Harrison Street, and increasing damage to the gate and fence on the Brandon Street perimeter. Repairs intended to the restrict vehicle access to the Slag Processing Area were disturbed by trespassers.

ICs in place include zoning restrictions at the Acid Lagoon Area and the Main Plant Area limiting the use to industrial/commercial use, and a local zoning ordinance (City of Kokomo Zoning Ordinance, as amended by Ordinance No. 6375, May 9, 2005; Articles 1 through 11), that prohibits installation of wells in the area affected by the site.

Interviews

Interview forms were provided with the fact sheets and during the public availability sessions on April 23, 2007, and on the IDEM Web site. Five interview sheets were completed. The report of results is presented in Attachment 4.

Table 11 - Community Concerns and Responses

Concern	Response
Concerned that planned highway construction will have the effect of damaging the RAs.	The planned highway construction is several miles east of the nearest RA. U.S. EPA and IDEM do not believe that ground vibrations will have a detrimental effect on the RAs.
Concerned about whether the walls in the center of the site will remain.	The center wall will be partially demolished and covered. Fill will be added and the area will be graded to establish a gentle slope as part of the final cover RA.
Concerned about contaminants in groundwater near the Markland Quarry. Wants copies of investigation reports and design documents.	The sample results discussed above indicate that contaminants in groundwater are not a current threat to residential receptors. The requested documents will be provided.
Industrial development/businesses should pay for own cleanup.	The U.S. EPA policies emphasize funding of cleanups by the Potentially Responsible Parties (PRPs) that are responsible to contribute to cleanup costs under CERCLA. Approximately 75% of cleanups are funded by PRPs. Funds from the bankruptcy settlement of Continental Steel are contributing to the cost of the cleanup. $2 million was awarded for environmental cleanup through the 1986 bankruptcy. That money has been kept in a trust account. $1 million was spent for the interim closure of the Acid Lagoons. The remainder, and interest earned, is being used for the Main Plant work. Approximately $4.75 million dollars were and are being contributed from this account. Approximately $1.6 million was

	realized from the scrap proceeds when scrap from the Continental Steel buildings was sold. Since Continental Steel Corporation became a bankrupt entity, no more funds can be acquired from Continental Steel Corporation.
Reuse of Main Plant area as park	Decisions about future use are made by the local government and community. U.S. EPA provided $100,000 that was used for the development of a reuse plan for the Main Plant. That reuse plan was developed with community input and according to existing zoning. In accordance with the proposed future uses that the community provided, IDEM and U.S. EPA have set cleanup levels that would allow for recreational, commercial or industrial use of the Main Plant. The Acid Lagoon area and Slag Processing area cleanup levels will allow for commercial/industrial use. The Markland Quarry area cleanup will allow for residential, recreational, commercial or industrial use. There will be restrictions on excavation and groundwater use in all areas. Where cover was applied that cover or equivalent cover will need to be maintained. The nature and footprint of the cover could be adjusted as appropriate to accommodate final redevelopment plans to the extent feasible as long as protectiveness in maintained.
Proper environmental cleanup, stream dredging.	The stream dredging work is in progress. The work is being overseen by U.S. EPA, IDEM and the Army Corps of Engineers.
Main Plant owner has not paid property taxes.	Property tax collection is under the authority of Howard County.

VII. Technical Assessment

Question A
Is the remedy functioning as intended by the decision documents?
Answer A
Yes. The review of documents, Applicable or Relevant and Appropriate Requirements (ARARs), risk assumptions, and the results of the site inspection indicate that further information is needed in order to determine whether the remedy, when implemented, would function as intended by the ROD. The remedy components that have not been constructed include the Slag Processing Area regarding and final cover, Markland Quarry sediment removal and final cover, Acid Lagoon area in place closure of lagoons and final cover, Main Plant heated soil vapor extraction for removal of VOCs, and site wide groundwater remedy construction has not begun. Main Plant final contaminated soil consolidation and cover and the Kokomo and Wildcat creeks dredging components are currently under construction, therefore there is no information on the effectiveness of the RAs.

The required ICs have not been fully implemented. These include the land use restrictions in the form of Restrictive Covenants that are components of the RAs for OU5 (Main Plant Area), OU2 (Acid Lagoon Area), OU4 (Markland Quarry Area), and OU6 (Slag Processing Area). Implementing and maintaining ICs will be required to assure protectiveness of the remedy. Based on inspections and interviews, although the property is currently zoned for commercial/industrial

use it is not now being used, and there is evidence of trespassing. Therefore, the remedy is not functioning as intended. U.S. EPA expects the remedy to be protective once the remedy is implemented including implementing effective institutional controls which are maintained and monitored.

There were no opportunities for system optimization observed during this review. The proposed future use of the Main Plant is recreational, and the RA cleanup goals for the Main Plant Area were developed to be protective for recreational use. The current zoning restriction that limits the use of this area to commercial/ industrial will require adjustment to allow for the planned recreational use.

Question B
Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?
Answer B
Yes. Data was collected in Kokomo and Wildcat Creeks from December 2006 through March 2007 to determine whether any change in sediment volumes or locations had occurred since the streams were sampled in 2001. Changes were observed and the planned dredge locations and volumes were adjusted accordingly to meet or exceed the goals in the ROD Amendment of 2003. There have been no other changes in the physical conditions of the site that would affect the protectiveness of the remedy.

Since RA construction is not complete in any of the areas, there has been no demonstration that the RA goals have been met.

The exposure assumptions used to develop the Baseline Human Health Risk Assessment (BHHRA) are listed in the following table.

Table 12 - Baseline Risk Assessment - Populations That May Be Exposed

Receptors	Current	Future
Onsite residents		**MQ, SP, GW/MQ, GW/SP**
Offsite Residents	**MP(**), MQ(***), GW(*)**	**MP(**), MQ, GW**
Onsite Commercial/Industrial Workers	MQ	**MP**, MQ, **AL**, SP, GW
Offsite Commercial/Industrial Workers	GW	GW
Trespassers	**MP**, MQ, **AL**, SP	**MP**, MQ, **AL**, SP
Recreational Visitors	**KWC**	**KWC**
Onsite Construction Workers		**MP**, MQ, **SP**, GW

MP= Main Plant Area, MQ = Markland Quarry, AL = Acid Lagoon Area, SP = Slag Processing Area, GW = Groundwater, KWC - Kokomo and Wildcat Creeks
*Exposure routes that exceeded cancer or non-cancer criteria are indicated by **bold** print.*
(*) No current off-site residents within the affected area are believed to be using groundwater.
(**) This risk was addressed by the NTRA performed from 1998 to 1999.
(***) BRA recommended further investigation. See Sections VIII and IX.

These assumptions are considered to be conservative and reasonable in evaluating risk and developing risk-based cleanup levels.

The remediation goals for groundwater, set at the drinking water MCLs, were amended after the 2002 five year review to add Arsenic at the drinking water MCL. The remediation goals still appear to be adequately protective.
Based on a review of updated ecological screening benchmarks, no new Contaminants of Potential Concern (COPCs) were identified for any exposure area.

Question C
Has any other information come to light that could call into question the protectiveness of the remedy?
Answer C
Yes. An assessment of the long term protectiveness of OU5 can not be made until necessary data on the Crushed Drum Area of OU5 has been collected and evaluated. A portion of the Main Plant Area, south of Kokomo Creek, was investigated during the RI and contaminants were not detected at levels that would present an unacceptable risk to human health or the environment. In the process of installing an 8-foot chain link fence around the area as part of the Decontamination and Demolition completed in 2000, IDEM discovered buried crushed drums in the area. The area was investigated by means of an electro-magnetic survey during the RD. Anomalies were noted suggesting that one or more buried tanks may be in this location. The fence and lock were damaged, possibly by crews who constructed a sewer lift station for the City of Kokomo. In 2007, U.S. EPA performed a limited investigation of the area and discovered large pieces of buried slag which may be the objects that were detected during the electro-magnetic survey. U.S. EPA also removed large piles of slag and cinders from this area and transported the material to the Acid Lagoon Area. Further investigation of the Crushed Drum Area is area is identified as an Action Item for this five year review.

Updated citations for many Indiana ARARs are provided in Attachment 3.

Technical Assessment Summary
The assessment of this five year review found that a long term protectiveness determination of the remedy, if carried out in accordance with the requirements of the ROD, cannot be made at this time. Further information must be obtained. There have been no changes in the physical conditions at the site that would affect the protectiveness of the remedy. There have been no changes to exposure pathways or toxicity factors for the COPCs used in the Baseline Risk Assessment, and no changes to the standardized risk assessment methodology that could affect the

protectiveness of the remedy. Further information will be obtained by taking the following actions:

1. Completing investigation of the crushed drum area and making a decision as to the need for RA.

VIII. Issues:

Table 13 - Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
1. The City of Kokomo has announced a proposed reuse of the Continental Steel Superfund Site that is primarily recreational use. The remedial goals are designed to be protective for recreational use, however current zoning limits use of the area to industrial/commercial use. Since the cleanup goals in the implemented remedy are more conservative than the currently zoned use, this issue does not affect the protectiveness of the remedy.	N	N
2. Data indicates contamination from CSSS contributed to levels of PCBs in fish, and presents a direct contact risk to recreational users. A level-five (5) fish consumption advisory is in place for Kokomo and Wildcat Creeks, designating all fish from this stream unsafe for human consumption in any amount. Fish consumption advisory signs are posted. No physical barrier prevents access to the creeks. Kokomo Creek runs through Highland Park. Children and adults have been observed fishing in Kokomo Creek.	N	Y
3. Fences around the Acid Lagoon Area, the Slag Processing Area and the Markland Avenue Quarry Area are not intact. There is evidence of recent trespassing in these areas.	Y	Y
4. Full investigation of the Crushed Drum area has never been funded. The City of Kokomo Parks Department has offices adjacent to this area and would like to acquire the area for use as a storage yard. The investigation needs to be completed, the necessity for action determined and any necessary RA should be completed.	N	Y
5. Construction of the remedy, including fully implemented and effective ICs, has not been completed. Both 1) evaluating existing ICs and 2) implementing and maintaining effective ICs are required for the Main Plant, Acid Lagoon, Markland Quarry and Slag Processing Areas to assure protectiveness of the remedy.	N	Y

IX. Recommendations and Follow-up Actions:

Table 14 - Recommendations and Follow-Up Actions

Issue	Recommendations/Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
1. The remedial goals are design for recreational use, current zoning limits use to industrial/commercial.	IDEM and U.S. EPA are coordinating with Kokomo/Howard County to maximize incorporation of re-use plans into the RD. Kokomo/ Howard County may seek to change the zoning restrictions on the Main Plant if they acquire the property and wish to proceed with the recreational use plan.	IDEM/ U.S. EPA and Kokomo/ Howard County	IDEM/ U.S. EPA	6/30/08	N	N
2. Creek sediments, exposure risks	Excavation will eliminate the risk of direct contact with creek sediment. However, levels of PCBs in fish are not expected to decrease enough to render fish edible for several years. Potential threats to human health through fish consumption are temporarily addressed by Fish Consumption Advisory signs. Further public education is advised. Signs in contaminated areas discourage consumption of fish.	IDEM/ U.S. EPA	IDEM/ U.S. EPA	6/30/08	N	Y
3. Fence Repairs	Fence repairs where necessary to all of the site areas will be included in the RA. IDEM is funding and performing ongoing fence maintenance in the Main Plant area.	IDEM/ U.S. EPA	IDEM/ U.S. EPA	4/30/08	Y	Y
4. Crushed Drum Area scuth of the Kokomo Creek	Further investigation will be performed and a determination as to any action necessary.	IDEM/ U.S. EPA	IDEM/ U.S. EPA	12/30/09	N	Y
5. Construction of the remedy,	IDEM must begin the process of evaluating the land use restrictions.	IDEM/ U.S. EPA	IDEM/ U.S. EPA	12/30/09	N	Y

including fully implemented effective ICs, has not been completed. Both 1) evaluating existing ICs and 2) implementing and maintaining effective ICs are required for the Main Plant, Acid Lagoon, Markland Quarry and Slag Processing Areas to assure protectiveness of the remedy.	It is anticipated that an IC Plan which includes evaluating existing ICs and planning for implementation of ICs and long-term Site stewardship will be completed.					

X. Protectiveness Statement(s):

Protectiveness Statement(s):
OU3, Wildcat and Kokomo creeks. U.S. EPA expects the remedy at OU3 to be protective of human health and the environment once the remedy is implemented including implementing effective institutional controls which are maintained and monitored. In the interim, exposure pathways that could result in unacceptable risks are being controlled.

OU5, Main Plant. A protectiveness statement for OU5 cannot be made at this time until further information is obtained. Information must be obtained for the Crushed Drum Area. Further information will be obtained by taking the following actions. Surface soil and debris piles will be sampled, and additional subsurface investigation will be performed as needed to confirm the presence or absence of underground storage tanks. It is expected that these actions will take approximately one year to complete, at which time a protectiveness determination will be made.

XI. Next Review

The next five year review should be performed no later than five years from the date that this review is approved by IDEM and U.S. EPA. The triggering action is the signature date of the first five-year review, September 4, 2002. The review should be completed by September 4, 2012.

Attachments

Attachment 1 Site Map
Attachment 2 List of Documents Reviewed
Attachment 3 Table Documenting Changes in Standards and Updated Citations for Indiana ARARs)
Attachment 4 Community Interview Report
Attachment 5 Photos Documenting Site Conditions
Attachment 6 Checklist for Site Inspection
Attachment 7 Copy of Public Notice
Attachment 8 Five Year Review Fact Sheet

Appendices

Appendix A 1998 Record of Decision ARARs
Appendix B Comments received from Support Agencies and/or the Community
Appendix C Data Evaluation Summary Report, 2006/2007 Pre-Construction Sediment Investigation, Continental Steel Superfund Site
Appendix D Technical Memorandum, Wildcat and Kokomo Creeks (OU3) SWAC Evaluation, Continental Steel Superfund Site, Kokomo, Indiana

ATTACHMENT 1
Site Map

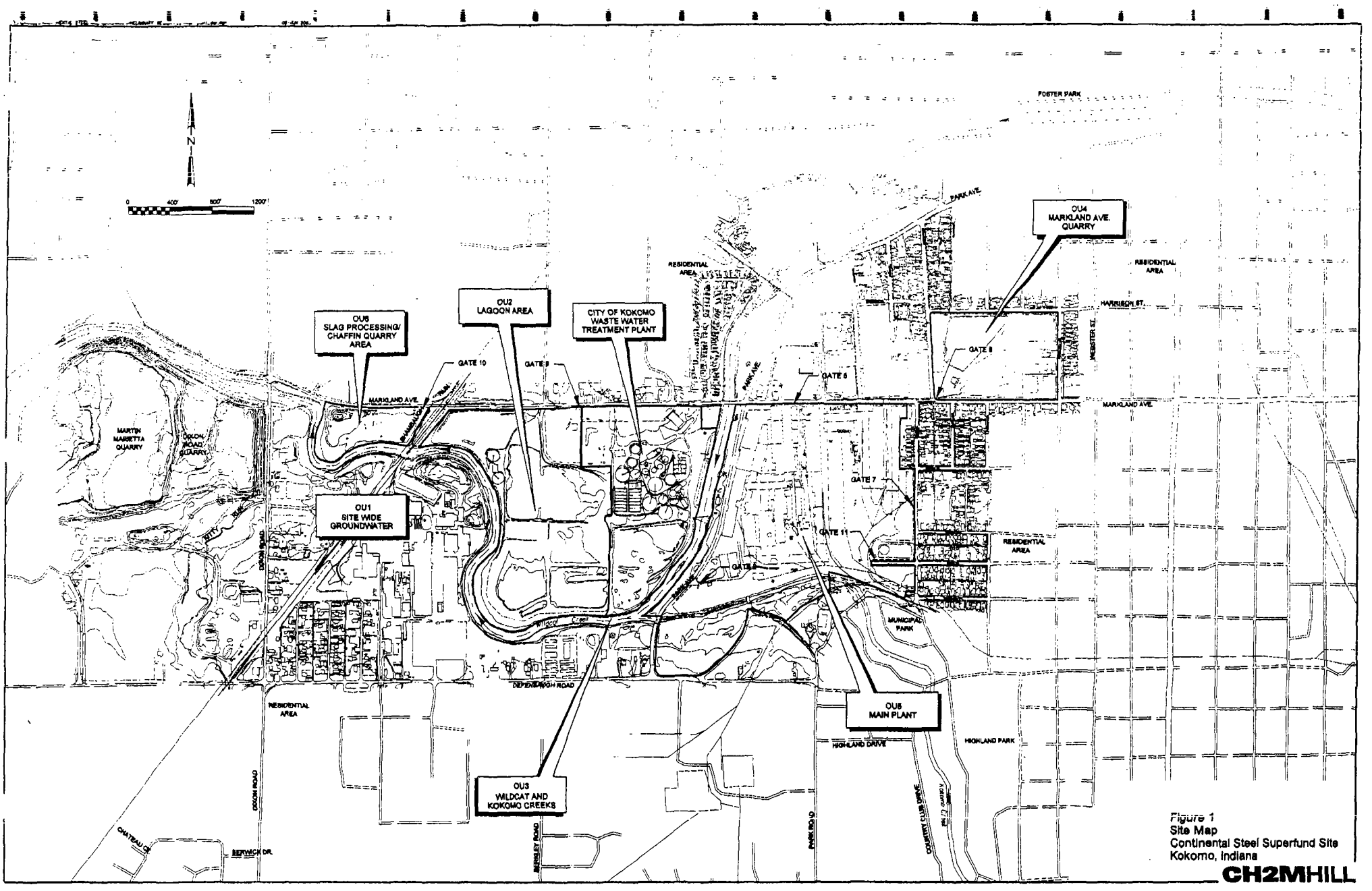


Figure 1
Site Map
Continental Steel Superfund Site
Kokomo, Indiana

CH2MHILL

ATTACHMENT 2
List of Documents Reviewed

ATTACHMENT 2

List of Documents Reviewed

Markland Quarry Documents

- Report of Soil Gas and Indoor Air Sampling of the Residential Community Surrounding the Markland Avenue Quarry (Continental Steel), Dave Shekoski/CH2M HILL MKE, February 4, 2004
- Bench Scale Test of Electrochemical Degradation of TCE in Quarry Water from Kokomo Continental Steel Superfund Site, James Fang and Souhail Al-Abed; EPA/ORD/NRMRL/ LRPCD/WMB
- Review of Data, Stephen L. Ostrodka, December 27, 2004

Main Plant Area Documents

- Indiana State Department of Health Chemistry Laboratory, Preliminary Results, Sample Delivery Group 1946, July 8, 2005 and Sample Delivery Group 1948, July 20, 2005
- US EPA Mobile Lab Final Report, Continental Steel, September 28, 2006
- US EPA Region V ESD Central Regional Laboratory Data, Sample Delivery Group E2NW4, CERCLIS No. IND001213503, Case No. 35706, Continental Steel Corp (IN), October 20, 2006
- VOC Remediation Area Soil Removal Sampling Report – Revised 2/18/07
- Main Plant Bank Soil Screening Results January 22, 2007
- EM-61 Survey, Imaging Subsurface, Inc., February 20, 2002
- Report of Laboratory Analysis, Sierra Mobile Labs, Inc., January 12, 2007
- Report of Analytical Services, Pace Analytical, Lab Project Number 5059049
- Report of Analytical Services, Pace Analytical, Lab Project Number 5058106

Ground Water Documents

- Continental Steel ground water cleanup goals listed in the 2002 five year review.
- Ground Water Ordinance - City of Kokomo Zoning Ordinance, as amended by Ordinance No. 6375, May 9, 2005; Articles 1-11
- Residential well data - February 20, 2003 data reports from IDEM to residents of:
  - 247 S. County Road 300 West;
  -1601 Stoneview Drive;
  -347 S. County Road 300 West;
  -1521 S. Dixon; and,
  -423 S. County Road 300 West.

Decision Documents

- Record of Decision Amendment, 2003
- Explanation of Significant Differences, 2005

Final Remedial Design Documents

- Basis of Design, Sitewide Ground Water, April 2004
- Basis of Design, Quarry Sediment Removal, April 2006
- Basis of Design, Quarry Final Cover, December 2003
- Basis of Design, Main Plant Final Cover, November 2004
- Basis of Design, Kokomo and Wildcat Creeks, January 2006

- Basis of Design, Lagoon Area, April 2006
- Basis of Design, Slag Processing Area, May 2004

ATTACHMENT 3

Table Documenting Changes in Standards and Updated Citations for Indiana ARARs

ATTACHMENT 3 - Table Documenting Changes in Standards and Updated Citations for Indiana ARARs

Source and Description	Former Citation	Current Citation
Air Pollution Control Board. Air Pollution Control Board (Title 326), Article 2 – Permit Review Rules (326 IAC 2-1) [Lists general provisions for major new sources, including ambient air quality standards. New sources which have the potential to emit ~~25 tons per year of a hazardous~~ any air pollutant must apply for a ~~part 70~~ permit].	326 IAC 1-1 326 IAC 1-3	326 IAC 2-1
Air Pollution Control Board. ~~New sources which have the potential to emit 25 tons per year of a hazardous pollutant must apply for a Part 70 permit~~ Permit Review Rules (326 IAC 2-1) [Lists general provisions for major new sources, including ambient air quality standards. New sources which have the potential to emit any air pollutant must apply for a permit	326 IAC 2-1	326 IAC 2-1
Air Pollution Control Board. Sets criteria that sources ~~which emit 3 lbs/day of volatile organic compounds need to register with the Office of Air Management~~ which become subject to the rule within Article 8 under any other rule applicability section in Article 8. Requires recordkeeping, reporting and restrictions when applicable.	326 IAC 8-6	326 IAC 8-6
(15)Solid Waste Management Board (Title 329), Article 10 - Solid Waste Management, Special Waste (329 IAC 10-8.2 Management Requirements for Certain Solid Wastes) ~~[Defines what qualifies as a special waste, including asbestos containing waste, and waste characterized as hazardous waste; describes the technical criteria for characterizing special waste and generator responsibility for special waste disposal~~] [Describes certain solid waste that must be managed using handling or disposal requirements described in the rule].	329 IAC 10-8.2	329 IAC 10-8.2
Water Pollution Control Board. Sets requirements for Water Quality Effluent ~~and includes minimum Surface Water Quality Standards~~ Water Pollution Control Board (Title 327), Article 2 - Water Quality Standards (327 IAC 2-1-6, 2-1-1.5 and 2-11) [Sets requirements for Water Quality Effluent and includes minimum Surface Water Quality Standards and Groundwater Quality Standards].	327 IAC 1-6 and 2-1-1.5	327 IAC 1-6, 327 IAC 2-1-1.5 and 327 IAC 2-11
Solid Waste Management Board. 329 IAC Article 10-16-3 - Wetlands Siting Restrictions ~~Solid Waste Management siting~~	329 IAC 2-10	329 IAC 10-16-3

~~and design standards for solid waste land disposal facilities.~~ Prohibits solid waste boundary of new solid waste land disposal facility from wetlands in violation of Section 404 of the Clean Water Act, as amended; and within the floodplain unless the waste is protected from flood water inundation by a dike; and establishes design standards for construction/demolition sites and restricted waste sites.		
Indiana Department of Environmental Management, Risk Integrated System of Closure (RISC) Technical Resource Guidance Document, ~~September 5, 2000~~ February 15, 2001. [Provides risk-based clean-up concentrations].	RISC Technical Resource Guidance Document, September 5, 2000.	Indiana Department of Environmental Management, Risk Integrated System of Closure (RISC) Technical Resource Guidance Document, February 15, 2001.
Indiana Department of National Resources, Indiana ~~Handbook for Erosion Control in Developing Areas~~ Stormwater Quality Manual. Establishes design criteria, standards and specifications for erosion control measures required within a construction site].	Indiana Department of National Resources, Indiana Handbook for Erosion Control in Developing Areas	Indiana Department of National Resources, Indiana Stormwater Quality Manual.
New York Department of Environmental Conservation (NYSDEC), Technical Guidance for Screening Contaminated Sediments, ~~1993~~ January 1999 reprint, NYSDEC Divisions of Fish and Wildlife and Marine Resources. [Provides sediment quality guidelines, update and reprint from 1993 edition, contains 1998 and 1999 change sheets].	New York Department of Environmental Conservation (NYSDEC), Technical Guidance for Screening Contaminated Sediments, 1993	New York Department of Environmental Conservation (NYSDEC), Technical Guidance for Screening Contaminated Sediments, January 1999 reprint

* This portion of the requirement was not included in current updated rule.

ATTACHMENT 4
Report of Community Interviews

ATTACHMENT 4
Report of Community Interviews

Five community members completed surveys. One of the five did not complete the second page of questions. The results are reflected below.

Community interview sheet/Continental Steel Superfund Site

Please tell us a little about yourself:

_____
Name

_____ _____
Address (*optional*) Phone (*optional)*

4 Private individual
0 Nearby business representative
0 Local Labor representative
0 City/ County elected official
0 Environmental group representative
1 City/County agency, department or organization representative
4 Kokomo resident

How many years have you lived here?
0 0-5 years
0 5-10 years
0 10-20 years
1 20-30 years
3 more than 30 years

0 Not a resident of the Kokomo area *(There were no responses to this item.)*

What is your main concern about the Continental Steel site?
Private owner hasn't paid taxes on property
Don't know when decision was made to turn area into a park.
Wants area turned into a park with walking trails.
Effective reclamation
The long term value of a contaminated site.
Proper environmental cleanup, stream dredging.

Do you use Kokomo or Wildcat creeks for:
0 Fishing, catch & release
0 Fishing, catch & eat
1 Wading
1 Boating (Paddling, water sampling)

Are you aware of the Fish Consumption Advisory?

5 Yes
0 No

Do you use a well for drinking water? (If yes, please give us your address)

3 Yes
2 No
If yes, please provide your address:__*(addresses were provided)*_____

Do you feel that the site poses risks now to members of the community?

1 Yes
1 No
3 Unsure

If you have a question or problem with the site, do you know whom to contact?

4 Yes
1 No

Do you think that community understanding and concern about the site is strong enough to impact the quality of the investigation and cleanup?

2 Yes
1 No
2 Some

How do you feel about the rate of the investigation and cleanup?

2 Good or okay
3 Slow
0 Other

What do you think might be the reason(s) for the time involved?

Money, politics and who gets the glory and praise,

How would you rate your understanding of the Superfund process?

1 Very good
1 Medium
2 Poor

Have information updates been frequent enough?

2 Yes
1 No
1 unaware of any

How would you suggest that we improve communication?
Information packets located in business establishments and government buildings.

Do you feel that news media is reliable?
0 Yes
1 No
2 Sometimes

What do you think is the best way to reach you with factual information?
☐ Fact sheets /mailings ☐ E-mail ☐ Radio
☐ Newspaper ☐ Meetings ☐ Individual interviews
(No answers were received for this question.)

Please choose your top 4 sources of information, and rank them 1-4.

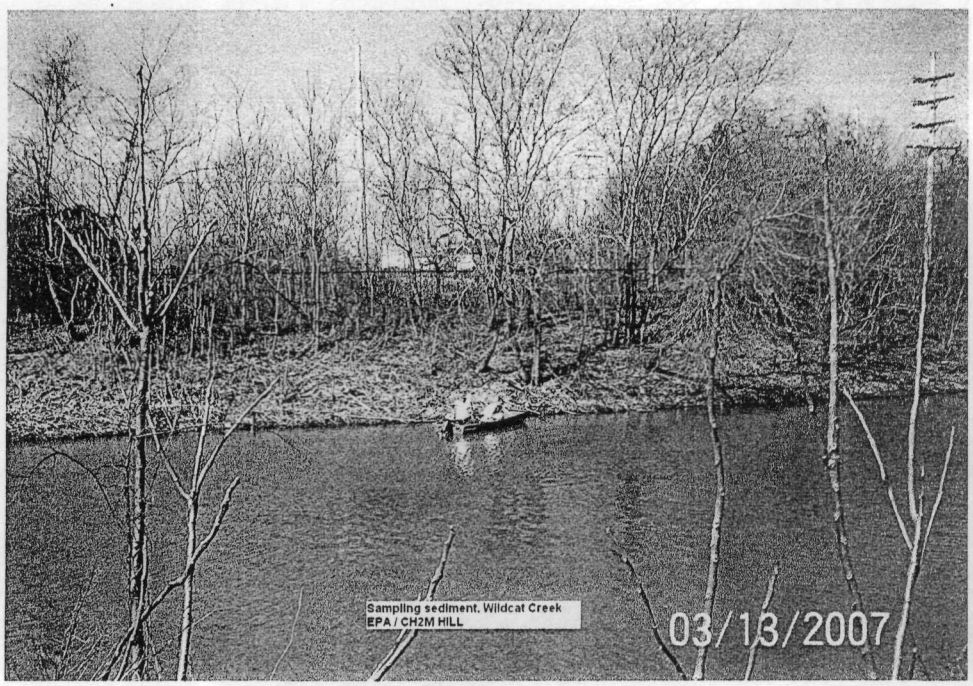
1133	*Fact sheets (from IDEM or U.S. EPA)		Other
224	*Public meetings	3	Neighborhood associations
114	*Newspaper	5	Radio
2344	*City/County Officials	2	Television
	Information repository (library)		Labor organization
	Community/church organizations		Civic/community meetings
	City or County internet web sites		Other elected representatives
	IDEM internet web site		

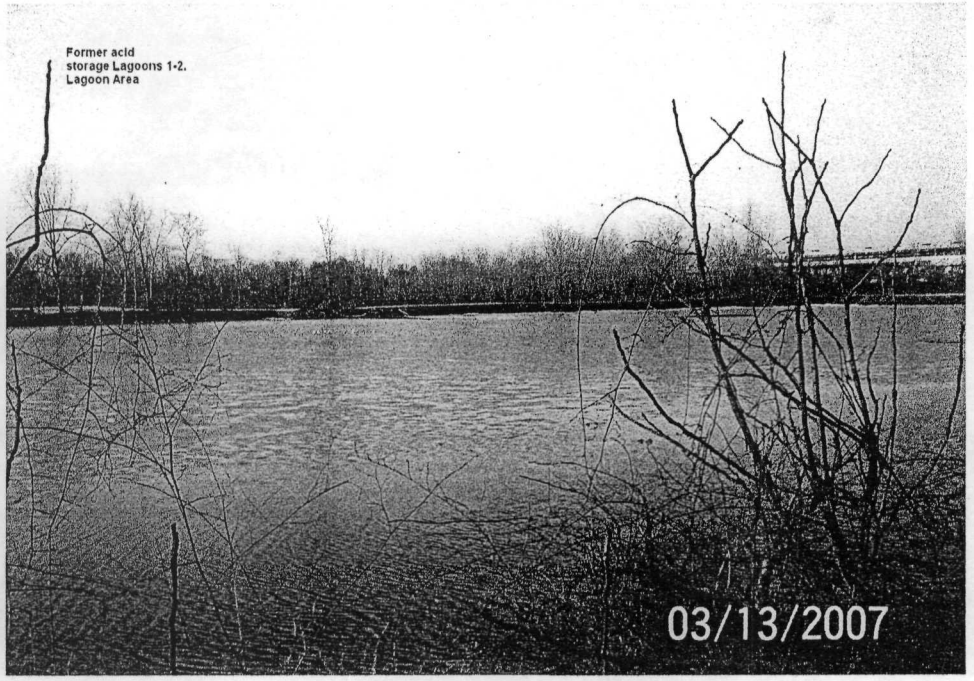
** These were the top sources of information identified in community interviews during the 2002 five year review.*

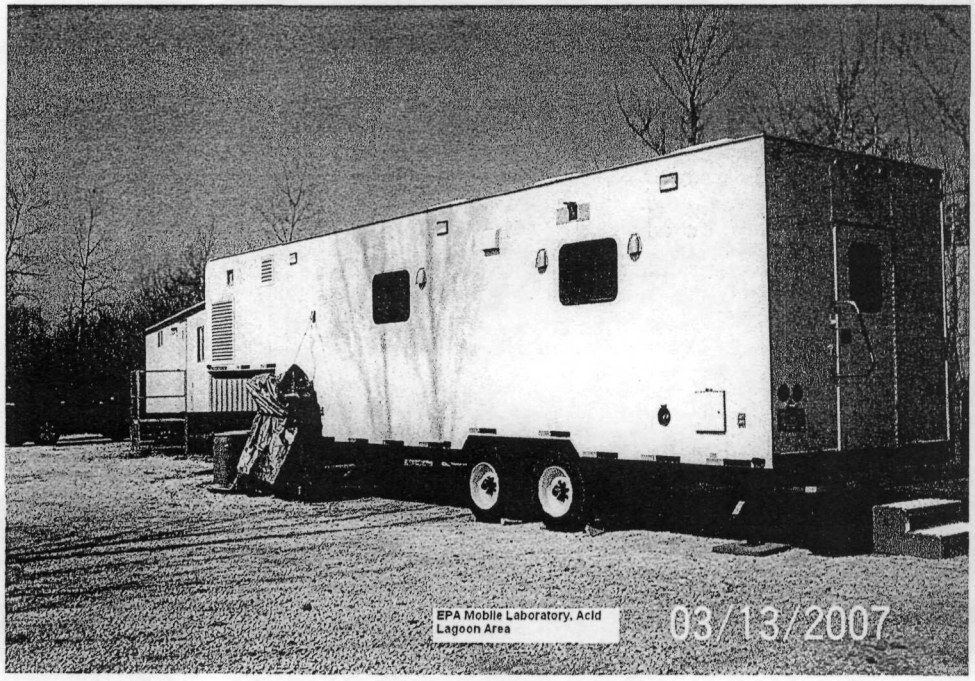
Are you concerned about the cost of the cleanup to taxpayers?
3 Yes
1 No

Do you have any suggestions?
Businesses should clean up their own mess.
Future industrial development must be made to provide escrow account for potential cleanup equal to 1-2% of annual gross sales.

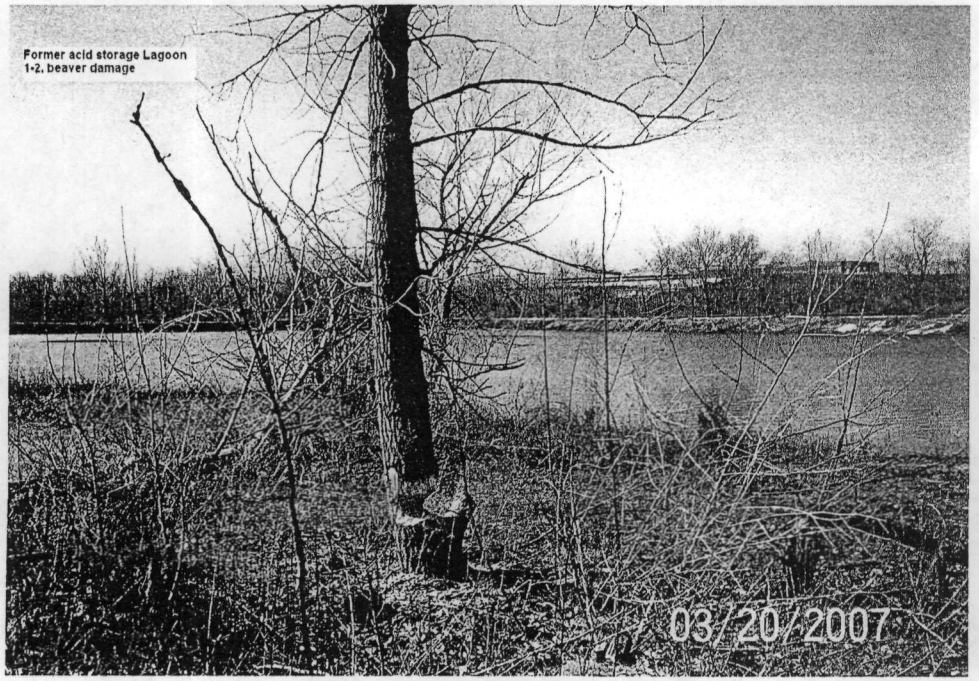
Do you have any other comments or concerns?
Thanks for the open house, good opportunity for community to ask questions.
Industrial developments must be made to pay for any environmental cleanup.
Incorporate past history of the plant into any future designs or uses of the plant.


Sampling sediment, Wildcat Creek
EPA / CH2M HILL
03/13/2007

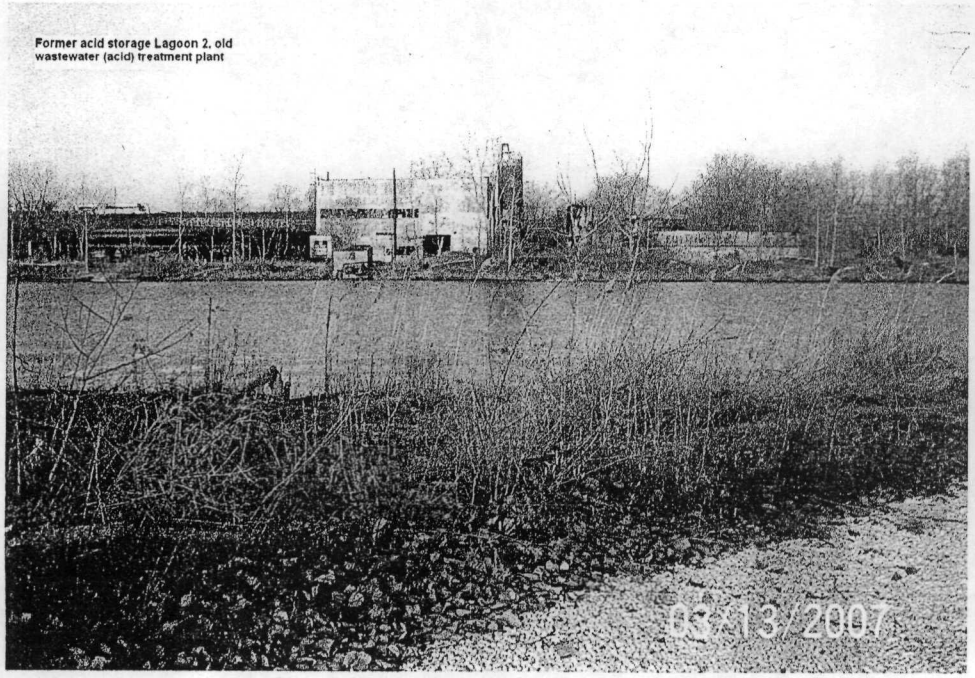

Former acid
storage Lagoons 1-2,
Lagoon Area
03/13/2007


EPA Mobile Laboratory, Acid
Lagoon Area
03/13/2007


Fence gap, between Lagoon Area
and Kokomo WWTP
03/13/2007

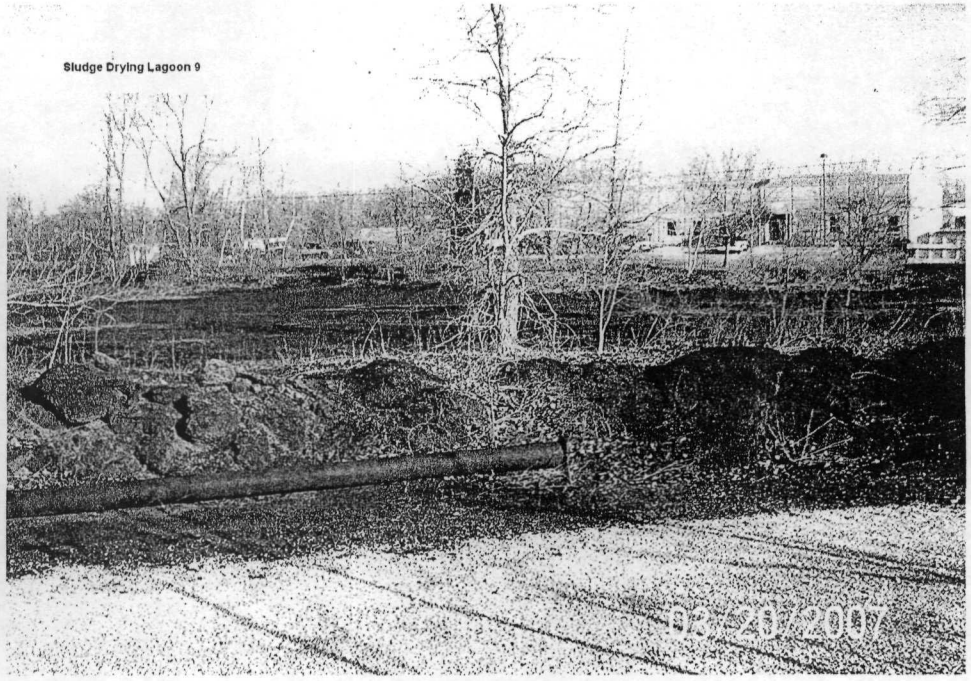

Former acid storage Lagoon
1-2, beaver damage
03/20/2007


Former Polishing Lagoon 4
03/20/2007


Former acid storage Lagoon 2, old
wastewater (acid) treatment plant
03/13/2007

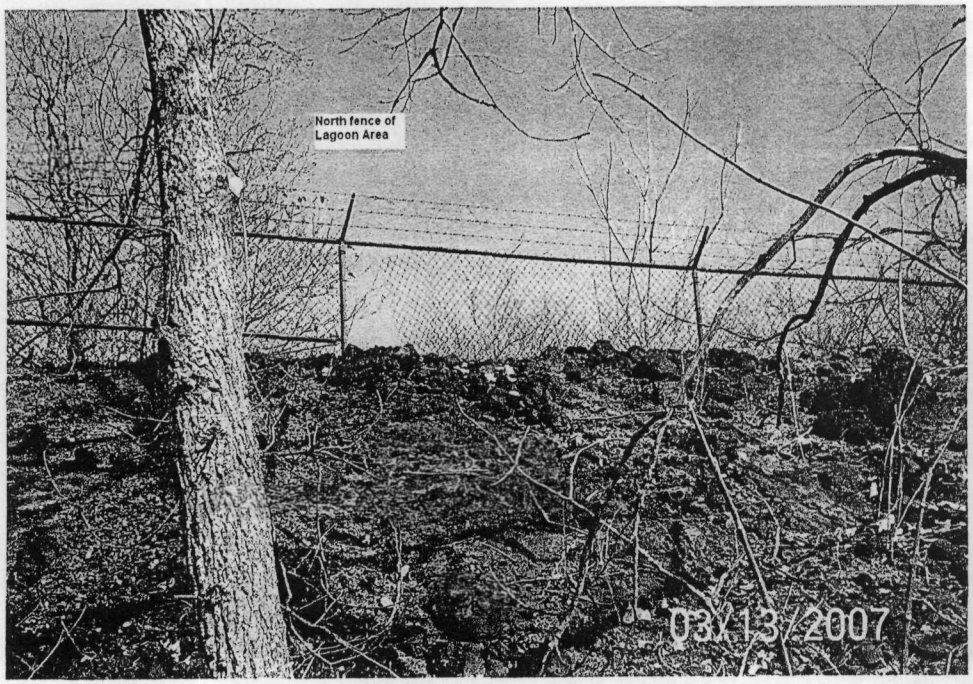

Former Polishing Lagoon 3


Former Polishing Lagoon 6, dewatering facility with
stored stormwater, east and south berms
03/13/2007


Sludge Drying Lagoon 9

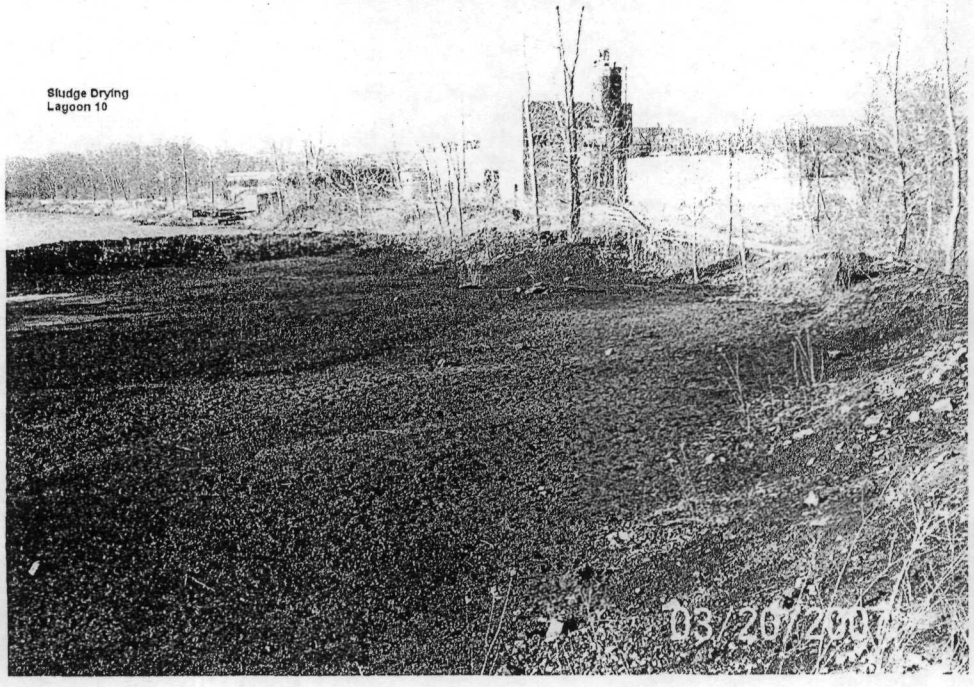

Former Polishing Lagoon 6, Dewatering facility with
stored stormwater, geotubes in bundles
03/13/2007


Former Polishing Lagoon 7

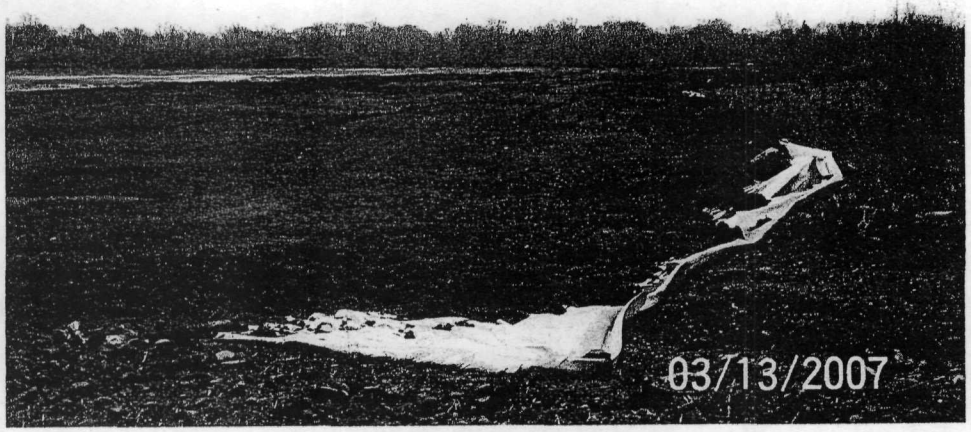


Main Plant, looking north from Gate 2, graded area and topsoil stockpile

Sludge Drying
Lagoon 10



Main Plant, east area, general
fill and orange fabric

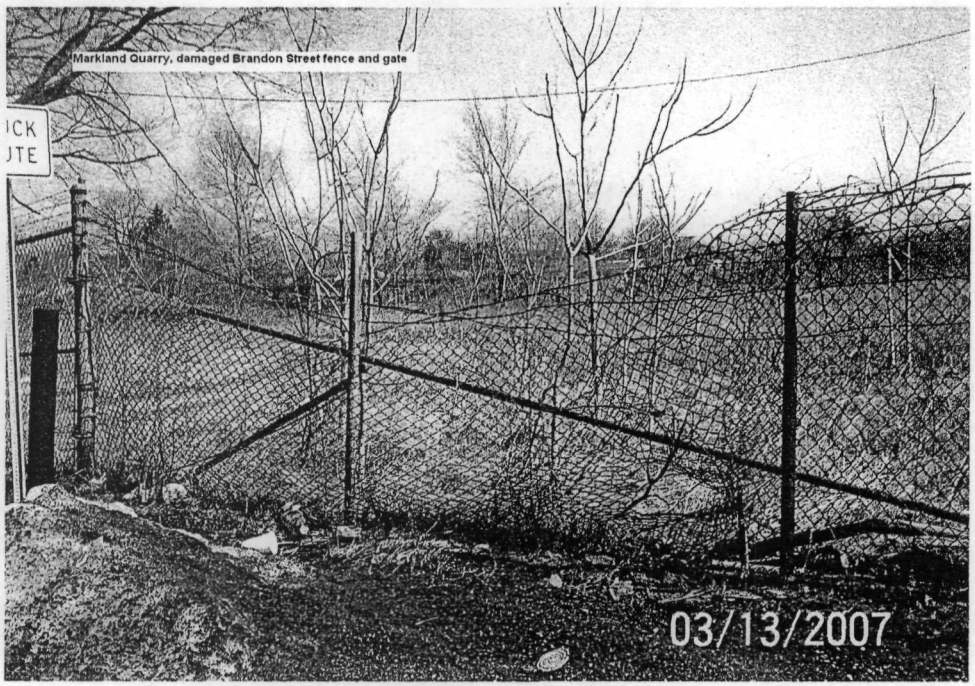


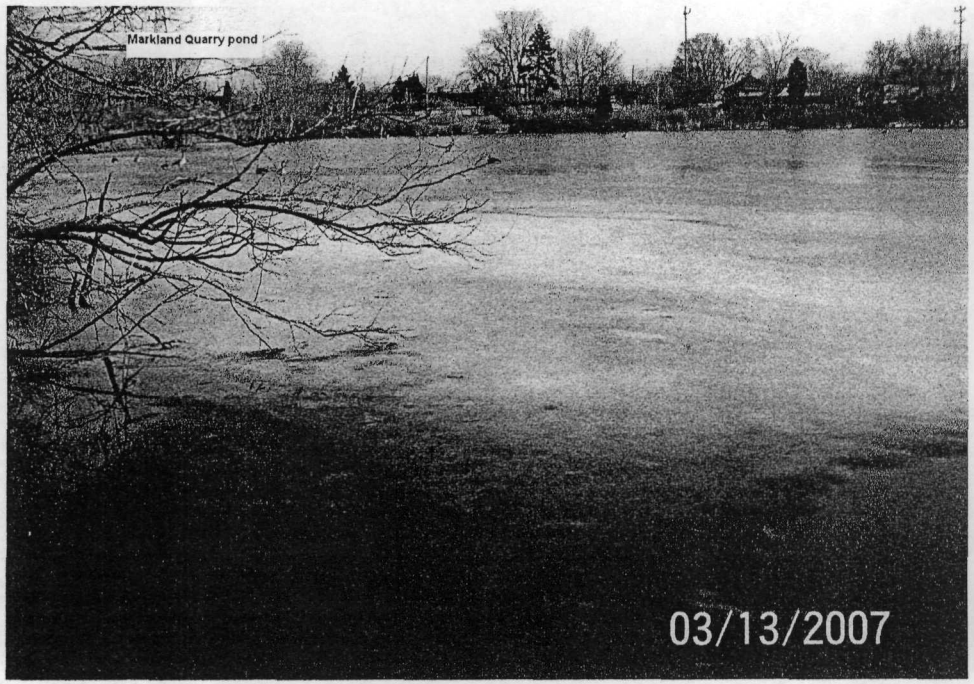
Main Plant, west area, looking south from Markland gate. Topsoil stockpile, office trailer.

Markland Quarry, gap in Brandon Street gate

Main Plant, looking southeast from central wall. Topsoil stockpiles and partially complete cover.

Markland Quarry, damaged Brandon Street fence and gate




Markland Quarry pond
03/13/2007


Surface debris in Markland Quarry Area
03/20/2007


Markland Quarry, Harrison St. fence, large hole near ground
03/13/2007


Markland Quarry, Webster fenceline, hole in fence.
03/13/2007


Markland Quarry Area
03/20/2007


Markland Quarry, debris and monitoring well nest 108.
03/20/2007


Surface debris in Markland Quarry Area
03/20/2007


Markland Quarry, railroad ties
03/20/2007


Markland Quarry surface debris
03/20/2007

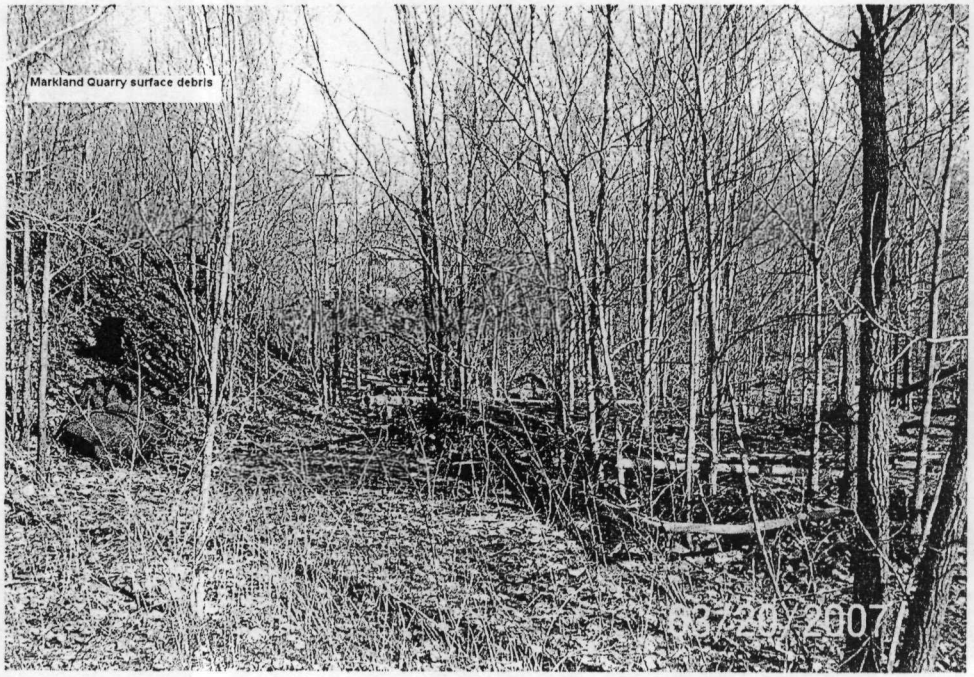

Markland Quarry, fire brick and metal debris
03/20/2007


Markland Quarry surface debris
03/20/2007


Markland Quarry, wire fencing.


Markland Quarry surface debris
03/20/2007


Markland Quarry debris
03/20/2007


Markland Quarry surface debris
03/20/2007


Markland Quarry, fire brick and miscellaneous debris
03/20/2007


Markland Quarry debris
03/20/2007


Markland Quarry, southwest bank of pond
20/2007

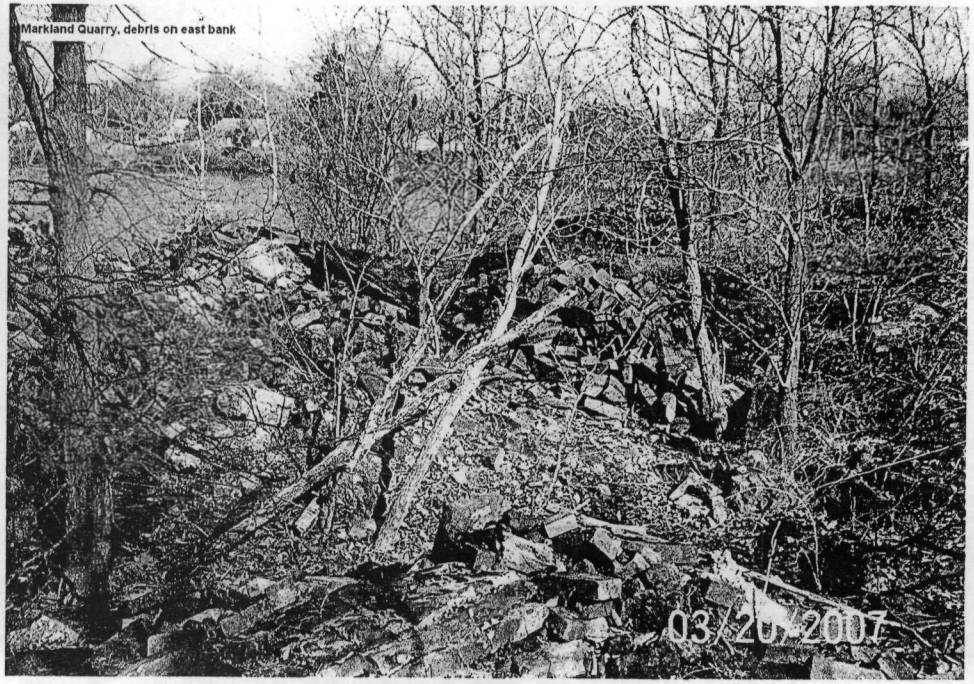

Markland Quarry debris
03/20/2007


Markland Quarry debris
03/20/2007


Markland Quarry, old rail line on east bank
03/20/2007

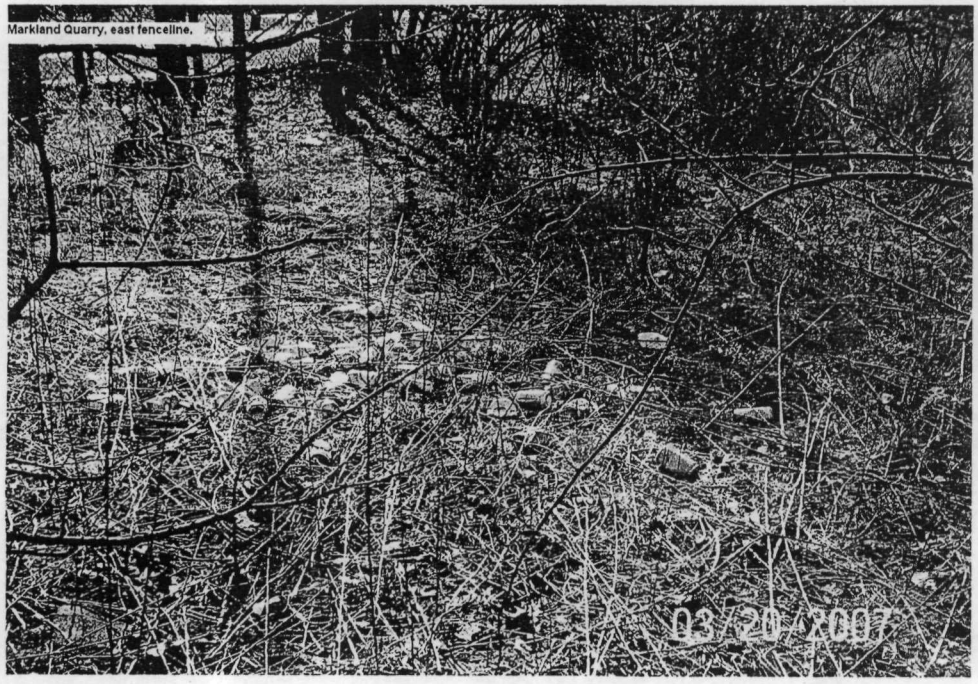

Markland Quarry, old rail line on east bank, nearby homes
03/20/2007


Markland Quarry, fire bricks arranged by trespassers
03/20/2007


Markland Quarry, debris on east bank
03/20/2007


Markland Quarry, southeast bank.
03/20/2007

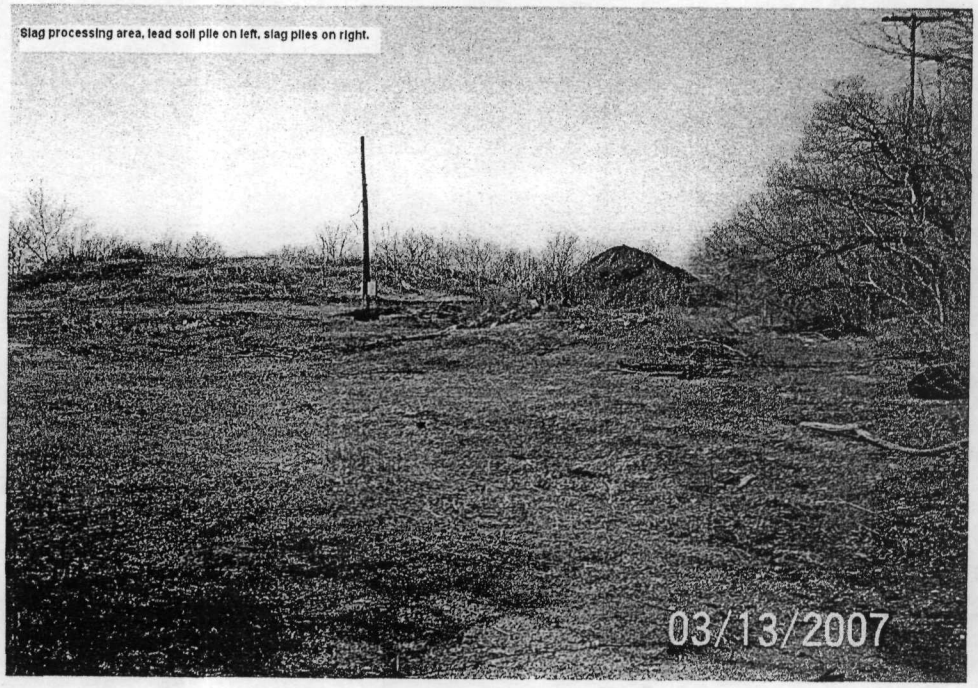

Markland Quarry, tanks and debris in crusher area, south west corner of site.
03/20/2007


Markland Quarry, east fenceline.
03/20/2007

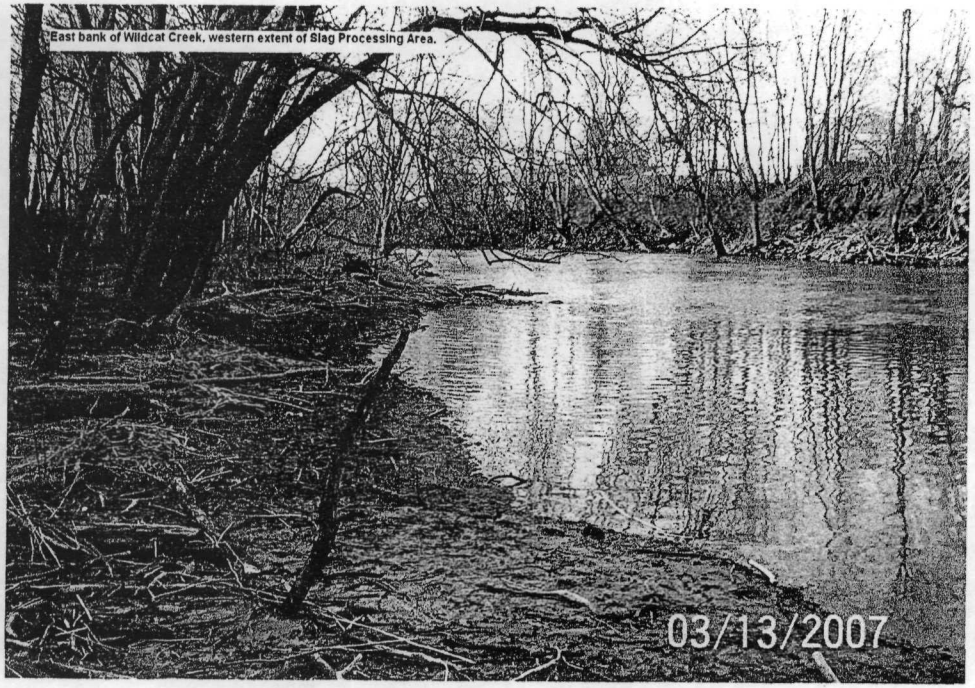

Markland Quarry, tanks on southeast bank
03/20/2007

Slag Processing Area entrance from Markland Avenue

Slag processing area, lead soil pile on left, slag piles on right.



East bank of Wildcat Creek, western extent of Slag Processing Area.



ATTACHMENT 6
Checklist for Site Inspection

Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: Continental Steel	**Date of inspection: 3/13/07 and 3/20/07**
Location and Region: 1200 West Markland Avenue, Kokomo, Howard County, Indiana	**EPA ID: IND001213503**
Agency, office, or company leading the five-year review: Indiana Department of Environmental Management	**Weather/temperature:** **3/13, Sunny, low 54°F, high 77 °F** **4/20, Mostly cloudy low 37°F, high 50°F**

Remedy Includes: (Check all that apply)

- ✓ Landfill cover/containment
  - ✓ Access controls
  - ✓ Institutional controls
  - ✓ Groundwater pump and treatment
  - ✓ Surface water collection and treatment
- √ Monitored natural attenuation
- Groundwater containment
- Vertical barrier walls
- ■ Other Heated soil vapor extraction, excavation and removal of sediment. Note that construction is not complete for any element or Operable Unit.

Attachments: ■ Inspection team roster attached ■ Site map attached X

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** N/A _____ _____ _____
   Name Title Date
   Interviewed ■ at site ■ at office ■ by phone Phone no. _____
   Problems, suggestions; ■ Report attached _____

2. **O&M staff** N/A _____ _____ _____
   Name Title Date
   Interviewed ■ at site ■ at office ■ by phone Phone no. _____
   Problems, suggestions; ■ Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ■ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ■ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ■ Report attached _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ■ Report attached _____

4. **Other interviews** (optional) ■ Report attached.

Community interviews, Attachment 6 to Five Year Review. Regulatory authorities and response agencies were invited to be interviewed but did not participate.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	■O&M manual	■Readily available	■Up to date	■N/A **X**
	■As-built drawings	■Readily available	■Up to date	■N/A **X**
	■Maintenance logs	■Readily available	■Up to date	■N/A **X**
	Remarks			
2.	**Site-Specific Health and Safety Plan**	■Readily available	■Up to date **X**	■N/A
	■Contingency plan/emergency response plan	■Readily available	■Up to date	■N/A
	Remarks			
3.	**O&M and OSHA Training Records**	■Readily available	■Up to date **X**	■N/A
	Remarks OSHA Training records for on-site personnel on file with OU5 RA construction contractor.			
4.	**Permits and Service Agreements**			
	■Air discharge permit	■Readily available	■Up to date	■N/A X
	■Effluent discharge	■Readily available	■Up to date	■N/A X
	■Waste disposal, POTW	■Readily available	■Up to date	■N/A X
	■Other permits	■Readily available	■Up to date	■N/A X
	Remarks			
5.	**Gas Generation Records**	■Readily available	■Up to date	■N/A X
	Remarks			
6.	**Settlement Monument Records**	■Readily available	■Up to date	■N/A X
	Remarks			
7.	**Groundwater Monitoring Records**	■Readily available	■Up to date	■N/A X
	Remarks			
8.	**Leachate Extraction Records**	■Readily available	■Up to date	■N/A X
	Remarks			
9.	**Discharge Compliance Records**			
	■Air	■Readily available	■Up to date	■N/A X
	■Water (effluent)	■Readily available	■Up to date	■N/A X
	Remarks			
10.	**Daily Access/Security Logs**	■Readily available	■Up to date X	■N/A
	Remarks Daily Access Logs for OU5 construction. No construction being performed at time of inspection.			

IV. O&M COSTS

1. **O&M Organization N/A**
   - ■ State in-house ■ Contractor for State
   - ■ PRP in-house ■ Contractor for PRP
   - ■ Federal Facility in-house ■ Contractor for Federal Facility
   - ■ Other _____

2. **O&M Cost Records N/A**
   - ■ Readily available ■ Up to date
   - ■ Funding mechanism/agreement in place
   - Original O&M cost estimate _____ ■ Breakdown attached

   Total annual cost by year for review period if available

   From _____ To _____ _____ ■ Breakdown attached
   Date Date Total cost

   From _____ To _____ _____ ■ Breakdown attached
   Date Date Total cost

   From _____ To _____ _____ ■ Breakdown attached
   Date Date Total cost

   From _____ To _____ _____ ■ Breakdown attached
   Date Date Total cost

   From _____ To _____ _____ ■ Breakdown attached
   Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons:

V. ACCESS AND INSTITUTIONAL CONTROLS ■ Applicable X ■ N/A

A. Fencing

1. **Fencing damaged** ■ Location shown on site map X ■ Gates secured ■ N/A
   Remarks Photos included in Attachment 5 to Five Year Review. Damage noted in OU2, OU4, and OU6.

B. Other Access Restrictions

1. **Signs and other security measures** ■ Location shown on site map X ■ N/A X
   Remarks Fish Consumption Advisory signs and warning signs on site fences.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ■Yes ■No ■N/A X

Site conditions imply ICs not being fully enforced ■Yes ■No ■N/A X

Type of monitoring (*e.g.*, self-reporting, drive by) _____

Frequency _____

Responsible party/agency _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up-to-date ■Yes ■No ■N/A

Reports are verified by the lead agency ■Yes ■No ■N/A

Specific requirements in deed or decision documents have been met ■Yes ■No ■N/A

Violations have been reported ■Yes ■No ■N/A

Other problems or suggestions: ■Report attached

None of the property included in the site is occupied on in use. ICs in the form of zoning restrictions are not being violated.

2. **Adequacy** ■ICs are adequate ■ICs are inadequate ■N/A X

Remarks ICs are expected to be adequate upon completion.

D. General

1. **Vandalism/trespassing** ■Location shown on site map X ■No vandalism evident

Remarks Photos included in Attachment 5 to Five Year Report

2. **Land use changes on site** ■N/A X

Remarks

3. **Land use changes off site** ■N/A X

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ■Applicable ■N/A X

1. **Roads damaged** ■Location shown on site map ■Roads adequate ■N/A

Remarks

B. Other Site Conditions

Remarks _____

_____

_____

_____

_____

_____

VII. LANDFILL COVERS ■Applicable ■N/A X

A. Landfill Surface

1. **Settlement** (Low spots) ■Location shown on site map ■Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Cracks** ■Location shown on site map ■Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____
   _____

3. **Erosion** ■Location shown on site map ■Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Holes** ■Location shown on site map ■Holes not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

5. **Vegetative Cover** ■Grass ■Cover properly established ■No signs of stress
   ■Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____
   _____

6. **Alternative Cover (armored rock, concrete, etc.)** ■N/A
   Remarks_____
   _____

7. **Bulges** ■Location shown on site map ■Bulges not evident
   Areal extent_____ Height_____
   Remarks_____
   _____

8.	**Wet Areas/Water Damage**	■ Wet areas/water damage not evident		
	■ Wet areas	■ Location shown on site map	Areal extent_____	
	■ Ponding	■ Location shown on site map	Areal extent_____	
	■ Seeps	■ Location shown on site map	Areal extent_____	
	■ Soft subgrade	■ Location shown on site map	Areal extent_____	
	Remarks_____			
9.	**Slope Instability**	■ Slides	■ Location shown on site map	■ No evidence of slope instability
	Areal extent_____			
	Remarks_____			
B. Benches	■ Applicable	■ N/A		
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	**Flows Bypass Bench**	■ Location shown on site map	■ N/A or okay	
	Remarks_____			
2.	**Bench Breached**	■ Location shown on site map	■ N/A or okay	
	Remarks_____			
3.	**Bench Overtopped**	■ Location shown on site map	■ N/A or okay	
	Remarks_____			
C. Letdown Channels	■ Applicable	■ N/A		
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	**Settlement**	■ Location shown on site map	■ No evidence of settlement	
	Areal extent_____	Depth_____		
	Remarks_____			
2.	**Material Degradation**	■ Location shown on site map	■ No evidence of degradation	
	Material type_____	Areal extent_____		
	Remarks_____			
3.	**Erosion**	■ Location shown on site map	■ No evidence of erosion	
	Areal extent_____	Depth_____		
	Remarks_____			

4. **Undercutting** ■Location shown on site map ■No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ■No obstructions
■Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
■No evidence of excessive growth
■Vegetation in channels does not obstruct flow
■Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations ■Applicable ■N/A

1. **Gas Vents** ■Active ■Passive
■Properly secured/locked ■Functioning ■Routinely sampled ■Good condition
■Evidence of leakage at penetration ■Needs Maintenance
■N/A
Remarks_____

2. **Gas Monitoring Probes**
■Properly secured/locked ■Functioning ■Routinely sampled ■Good condition
■Evidence of leakage at penetration ■Needs Maintenance ■N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
■Properly secured/locked ■Functioning ■Routinely sampled ■Good condition
■Evidence of leakage at penetration ■Needs Maintenance ■N/A
Remarks_____

4. **Leachate Extraction Wells**
■Properly secured/locked ■Functioning ■Routinely sampled ■Good condition
■Evidence of leakage at penetration ■Needs Maintenance ■N/A
Remarks_____

5. **Settlement Monuments** ■Located X ■Routinely surveyed ■N/A
Remarks Settlement monuments located on dewatering pad, to be surveyed during RA when dewatering pad is in use.

E. Gas Collection and Treatment ■Applicable ■N/A

1. **Gas Treatment Facilities**
   ■Flaring ■Thermal destruction ■Collection for reuse
   ■Good condition ■Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   ■Good condition ■Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   ■Good condition ■Needs Maintenance ■N/A
   Remarks_____

F. Cover Drainage Layer ■Applicable ■N/A

1. **Outlet Pipes Inspected** ■Functioning ■N/A
   Remarks_____

2. **Outlet Rock Inspected** ■Functioning ■N/A
   Remarks_____

G. Detention/Sedimentation Ponds ■Applicable ■N/A

1. **Siltation** Areal extent_____ Depth_____ ■N/A
   ■Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   ■Erosion not evident
   Remarks_____

3. **Outlet Works** ■Functioning ■N/A
   Remarks_____

4. **Dam** ■Functioning ■N/A
   Remarks_____

H. Retaining Walls ■ Applicable ■ N/A

1. **Deformations** ■ Location shown on site map ■ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** ■ Location shown on site map ■ Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge ■ Applicable ■ N/A

1. **Siltation** ■ Location shown on site map ■ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** ■ Location shown on site map ■ N/A
   ■ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** ■ Location shown on site map ■ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** ■ Functioning ■ N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS ■ Applicable ■ N/A X

1. **Settlement** ■ Location shown on site map ■ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   ■ Performance not monitored
   Frequency_____ ■ Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ■ Applicable ■ N/A X	
A. Groundwater Extraction Wells, Pumps, and Pipelines ■ Applicable ■ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** ■ Good condition ■ All required wells properly operating ■ Needs Maintenance ■ N/A Remarks_____
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ■ Good condition ■ Needs Maintenance Remarks_____
3.	**Spare Parts and Equipment** ■ Readily available ■ Good condition ■ Requires upgrade ■ Needs to be provided Remarks_____
B. Surface Water Collection Structures, Pumps, and Pipelines ■ Applicable ■ N/A	
1.	**Collection Structures, Pumps, and Electrical** ■ Good condition ■ Needs Maintenance Remarks_____
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ■ Good condition ■ Needs Maintenance Remarks_____
3.	**Spare Parts and Equipment** ■ Readily available ■ Good condition ■ Requires upgrade ■ Needs to be provided Remarks_____

C. Treatment System ■ Applicable ■ N/A

1. **Treatment Train** (Check components that apply)
   - ■ Metals removal ■ Oil/water separation ■ Bioremediation
   - ■ Air stripping ■ Carbon adsorbers
   - ■ Filters_____
   - ■ Additive (*e.g.*, chelation agent, flocculent)_____
   - ■ Others_____
   - ■ Good condition ■ Needs Maintenance
   - ■ Sampling ports properly marked and functional
   - ■ Sampling/maintenance log displayed and up to date
   - ■ Equipment properly identified
   - ■ Quantity of groundwater treated annually_____
   - ■ Quantity of surface water treated annually_____
   - Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   - ■ N/A ■ Good condition ■ Needs Maintenance
   - Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   - ■ N/A ■ Good condition ■ Proper secondary containment ■ Needs Maintenance
   - Remarks_____

4. **Discharge Structure and Appurtenances**
   - ■ N/A ■ Good condition ■ Needs Maintenance
   - Remarks_____

5. **Treatment Building(s)**
   - ■ N/A ■ Good condition (esp. roof and doorways) ■ Needs repair
   - ■ Chemicals and equipment properly stored
   - Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   - ■ Properly secured/locked ■ Functioning ■ Routinely sampled ■ Good condition
   - ■ All required wells located ■ Needs Maintenance ■ N/A
   - Remarks_____

D. Monitoring Data

1. Monitoring Data
   - ■ Is routinely submitted on time ■ Is of acceptable quality

2. Monitoring data suggests:
   - ■ Groundwater plume is effectively contained ■ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
   - ■ Properly secured/locked ■ Functioning ■ Routinely sampled ■ Good condition
   - ■ All required wells located ■ Needs Maintenance ■ N/A **X**

   Remarks_____

X. OTHER REMEDIES N/A

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.
D.	Opportunities for Optimization
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

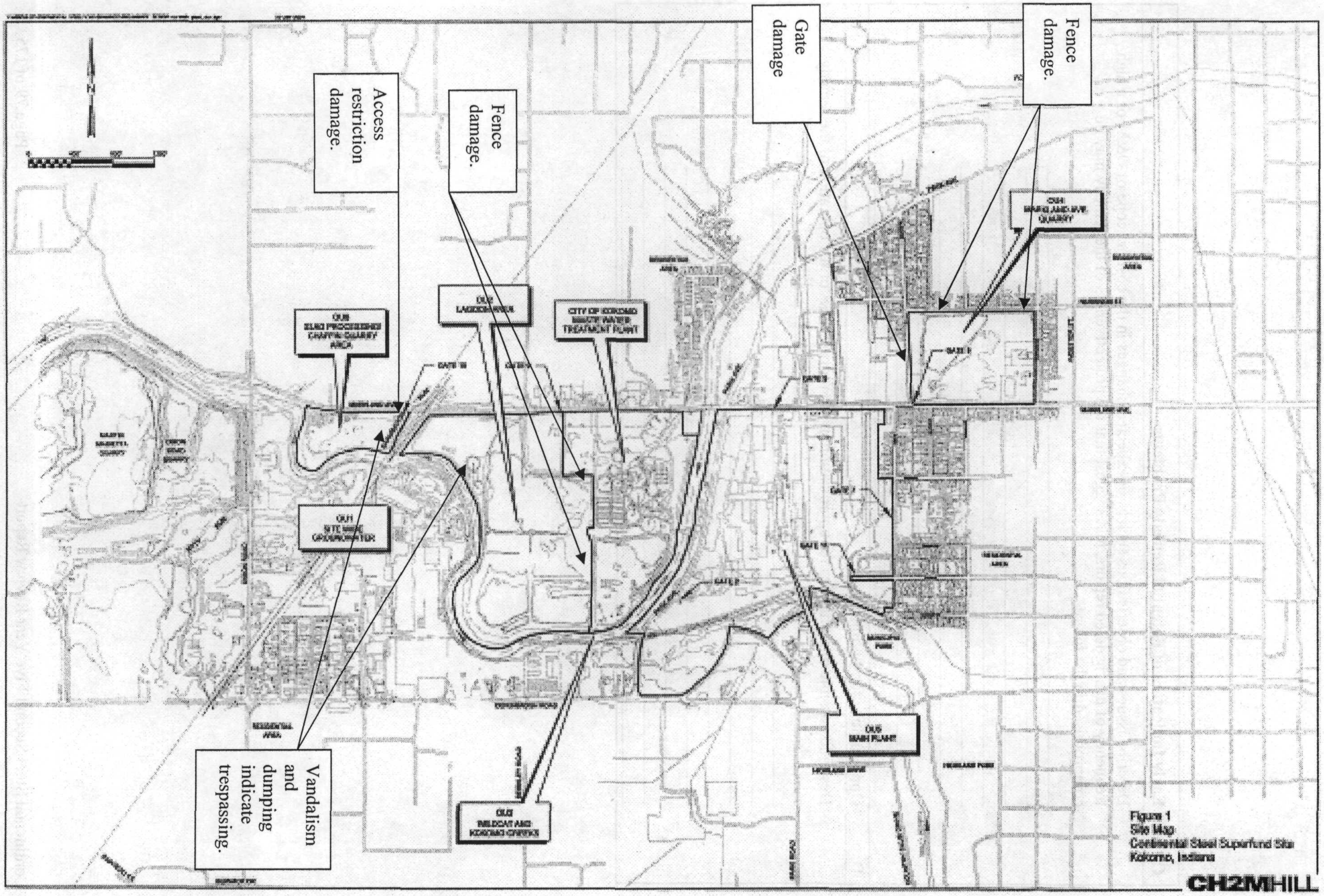


Figure 1
Site Map
Continental Steel Superfund Site
Kokomo, Indiana

ATTACHMENT 7
Copy of Public Notice

OF ADVERTISEMENT HERE

The Indiana Department of Environmental Management invites you to express your opinion at a public availability session as part of the Five-Year Review of cleanup actions at the Continental Steel Superfund Site

Monday, April 23, 2007

Availability Sessions: 1-3 p.m. and 6-8 p.m. EDT

Kokomo-Howard County Public Library, South Branch

Cardinal and Peony rooms

1755 East Center Road, Kokomo, Indiana

The Superfund law requires a review of a cleanup every five years, where hazardous wastes remain at a site. The first Five-Year Review for the Continental Steel Superfund Site was completed in 2002. IDEM will produce the second Five-Year Review Report, which will be available in the Fall of 2007.

Since the last Review, IDEM and the U.S. Environmental Protection Agency have performed these cleanup actions, which included:

- Removal of underground storage tanks and buried asbestos;
- Construction of dewatering facility for sediments;
- Partial completion of Main Plant Final Cover; and
- Pre-dredge sampling of Kokomo and Wildcat creeks.

The Federal Superfund Program and the State of Indiana have paid for the cleanup.

The site is currently in the Remedial Action Construction phase, where the additional cleanup actions will include:

- Excavation of contaminated soils and sediments;
- Off-site disposal of volatile organic compounds (VOC) contaminated soil from the Acid Lagoon Area and sediments from Kokomo and Wildcat creeks and Markland Quarry;
- In-place closure of acid storage and treatment lagoons and sludge storage lagoons in the Acid Lagoon Area;
- In-place treatment of VOC contaminated soil in Main Plant area;
- Two-foot compacted soil cover with vegetation where contamination is left in place;
- Institutional controls;
- Extraction with wells and treatment as needed of shallow and intermediate aquifer groundwater;
- Continued pumping at Martin Marietta Quarry; and
- Monitored natural attenuation of groundwater in the deep aquifer.

The Continental Steel Superfund Site is located on West Markland Avenue in Kokomo, Howard County, Indiana. From 1914 until bankruptcy and closure in 1986, Continental Steel produced nails, wire and wire fencing from scrap metal. Operations included the use, storage and disposal of hazardous materials. Contaminants of concern include metals, polychlorinated biphenyls, polycyclic aromatic hydrocarbons and volatile organic compounds.

For further information contact:
Pat Likins, Project Manager
IDEM, Office of Land Quality
100 North Senate Avenue, Indianapolis, IN 46204-2215
1-800-451-6027, extension 4-0357
or via email plikins@idem.IN.gov

Site documents are available for your review at:
Kokomo-Howard County Public Library, Genealogy Section
220 North Union Street
Kokomo, IN

K-381 April 15 #807324

Claim No. ______ Warrant No. ______

IN FAVOR OF
HHI Holdings Inc.
Kokomo Tribune

$ ....
On Account of Appropriation For

Appropriation No.: 63-1259862

Allowed ______ , 20
In the sum of $

I have examined the within claim and hereby certify as follows:

That it is in proper form.

That it is duly authenticated as required by law.

That it is based upon statutory authority.

That it is apparently (correct) (incorrect)

I certify that the within claim is true and correct; that the services herein itemized and for which charge is made were ordered by me and were necessary to the public business.

______ , 2004

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April 18, 2007 Kokomo Perspective Page D5
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The Indiana Department of Environmental Management **April 2007**
Fact sheet for a five year review of past and future remedial actions at the

CONTINENTAL STEEL SUPERFUND SITE

Kokomo, Indiana

The Indiana Department of Environmental Management (IDEM) invites you to attend a public availability session about the second five year review for the Continental Steel Superfund Site (CSSS) in Kokomo, Indiana. Staff from IDEM and the U.S. Environmental Protection Agency (U.S. EPA) will be available to provide information about the site's background, past and future cleanup actions, and the second five year review process. IDEM staff will also be demonstrating how to find CSSS documents on IDEM's Web site at: http://www.in.gov/idem/programs/land/federal/index.html.

Two public availability sessions will be held on **Monday, April 23, 2007,** from **1 to 3 p.m. and 6 to 8 p.m. at**:

Kokomo-Howard County Public Libarary
South Branch
1755 E. Center Road
Kokomo, IN 46902-5393

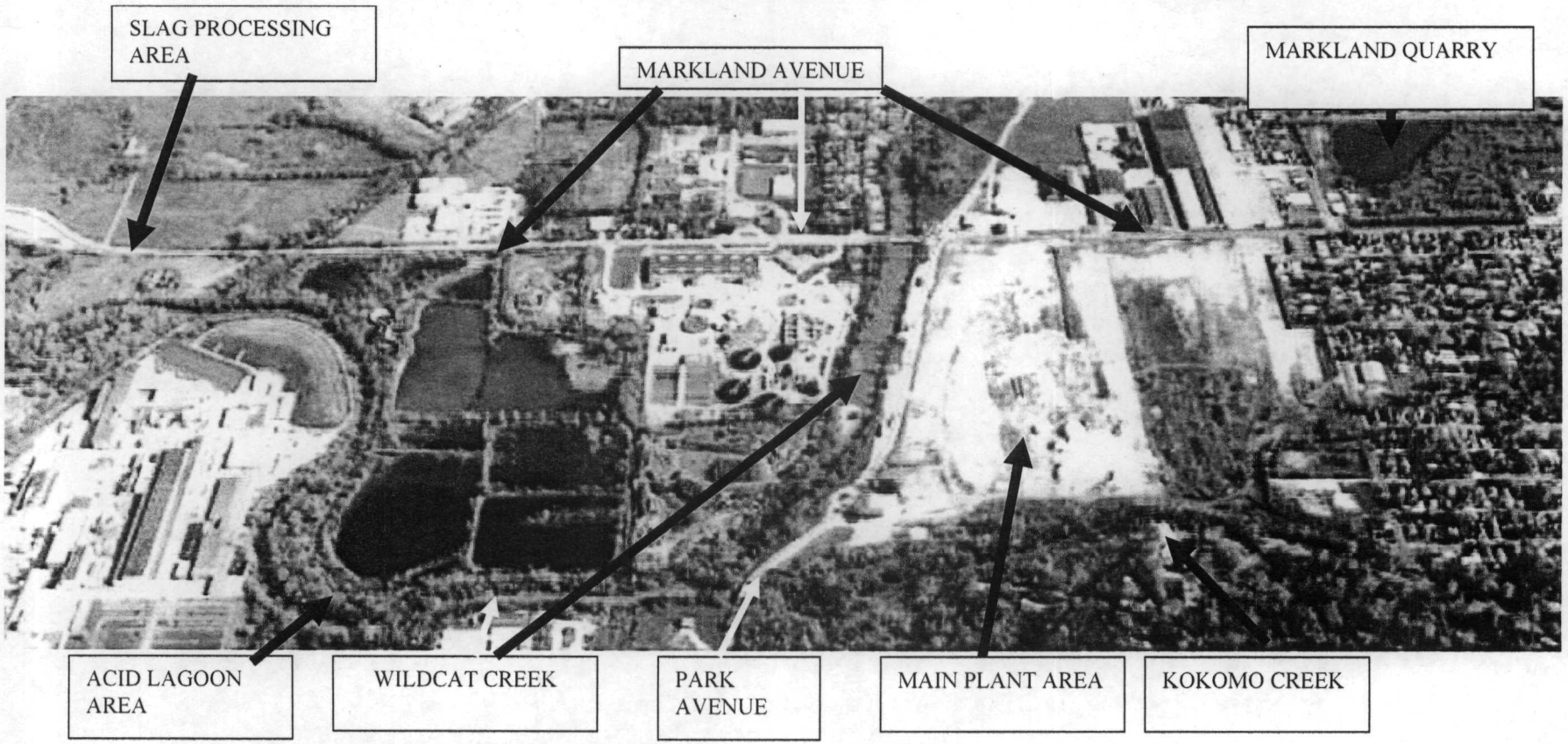
IDEM invites community members to express their opinions as part of this review. IDEM will accept written comments during the public availability sessions, or the public may mail written comments to IDEM using the community interview sheet provided at the back of the fact sheet.

The following projects have been completed at the Continental Steel Superfund Site:

- The interim closure of Acid Lagoon Area
- Removal actions at Markland Quarry, Acid Lagoon Area and Main Plant Area
- The removal of lead-contaminated residential soil
- The decontamination and demolition of Main Plant Area buildings
- The removal of underground storage tanks and buried asbestos
- The construction of a dewatering facility for sediments
- The partial completion of Main Plant Area final cover
- Pre-dredge sampling of Kokomo and Wildcat creeks

The following pages of this fact sheet include an aerial photo and additional information about CSSS. Sections I through IX contain background on CSSS, information about the five year review process, and history and cleanup actions at the various areas of CSSS. Section X explains the final remedial action. Sections XI through XIII contain a table of events, a table of acronyms and where to find more detailed information. A community interview sheet is provided at the back of the fact sheet, for community members to use.

2002 AERIAL PHOTO OF THE CONTINENTAL STEEL SUPERFUND SITE



I. Introduction

The Continental Steel Superfund Site (CSSS) covers 183 acres located on West Markland Avenue in Kokomo, Indiana. Continental Steel was built in 1914. It operated until 1986, when the company entered into bankruptcy. The area surrounding the facility is zoned residential, commercial, and industrial use. The Main Plant Area and the Acid Lagoon Area have industrial-use-only deed covenants. CSSS was placed on the National Priorities List (NPL), also known as the Superfund list, in 1989.

II. Basis for Taking Cleanup Action

IDEM investigated the site. Results indicated contaminants above the acceptable risk ranges established in the National Contingency Plan (NCP); 40 Code of Federal Regulations (CFR) 300.430 (e)(2)(I)(A). Based on those results, IDEM and U.S. EPA concluded that CSSS poses potential long-term risks to human health and the environment. IDEM and U.S. EPA signed the Record of Decision on September 30, 1998. The remedy is funded by the Superfund Trust Fund through U.S. EPA. The State of Indiana pays a 10 percent share.

III. The Five Year Review

IDEM is conducting the second five year review for CSSS. The review is required because:

(1) Some cleanup actions have been completed; and,
(2) Hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

Required by Law: Five year reviews are required by the Comprehensive Environmental Response, Compensation and Liabilities Act (CERCLA) Subsection 121 and the National Contingency Plan (NCP), 40 CFR 300.430(f)(4)(ii).

To determine if the remedy is protective of human health and the environment, the five year review looks at past and future actions and addresses these questions:

- Is the remedy functioning as intended by the decision documents?
- Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?
- Has any other information come to light that could call into question the protectiveness of the remedy?

The five year review includes community involvement; site inspection; report development; and, data and document review.

Community Involvement: IDEM invites community members to participate in individual interviews a public availability session on April 23, 2007, or complete the attached community interview sheet.

Site Inspections: IDEM inspected the site on March 13, and March 20, 2007.

Report Development: IDEM is developing a five year review report for release in fall of 2007, which will document the methods and findings of the five year review and make recommendations to address issues identified during the five year review process.

Data and Document Review: IDEM is conducting a review of documents for CSSS and providing these documents for public review on its Web site at http://www.in.gov/idem/programs/land/federal/index.html. The following is a list of these documents.

Markland Quarry Documents

- Report of Soil Gas and Indoor Air Sampling of the Residential Community Surrounding the Markland Avenue Quarry (Continental Steel), Dave Shekoski/CH2M HILL MKE, February 4, 2004
- Bench Scale Test of Electrochemical Degradation of TCE in Quarry Water from Kokomo Continental Steel Superfund Site, James Fang and Souhail Al-Abed; EPA/ORD/NRMRL/LRPCD/WMB
- Review of Data, Stephen L. Ostrodka, December 27, 2004

Main Plant Area Documents

- Indiana State Department of Health Chemistry Laboratory, Preliminary Results, Sample Delivery Group 1946, July 8, 2005 and Sample Delivery Group 1948, July 20, 2005
- US EPA Mobile Lab Final Report, Continental Steel, September 28, 2006
- US EPA Region V ESD Central Regional Laboratory Data, Sample Delivery Group E2NW4, CERCLIS No. IND001213503, Case No. 35706, Continental Steel Corp (IN), October 20, 2006
- VOC Remediation Area Soil Removal Sampling Report – Revised 2/18/07
- Main Plant Bank Soil Screening Results January 22, 2007
- EM-61 Survey, Imaging Subsurface, Inc., February 20, 2002
- Report of Laboratory Analysis, Sierra Mobile Labs, Inc., January 12, 2007
- Report of Analytical Services, Pace Analytical, Lab Project Number 5059049
- Report of Analytical Services, Pace Analytical, Lab Project Number 5058106

Ground Water Documents

- Continental Steel ground water cleanup goals listed in the 2002 five year review.
- Ground Water Ordinance - City of Kokomo Zoning Ordinance, as amended by Ordinance No. 6375, May 9, 2005; Articles 1-11
- Residential well data - February 20, 2003 data reports from IDEM to residents of:
  - 247 S. County Road 300 West;
  -1601 Stoneview Drive;
  -347 S. County Road 300 West;
  -1521 S. Dixon; and,
  -423 S. County Road 300 West.

Kokomo and Wildcat Creeks Documents

- Data collected for U.S. EPA by CH2M HILL from December 2006 through March 2007 (this will be placed on the IDEM Web site when it becomes available)

Decision Documents

- Record of Decision Amendment, 2003
- Explanation of Significant Differences, 2005

Final Remedial Design Documents

- Basis of Design, Sitewide Ground Water April 2004
- Basis of Design, Quarry Sediment Removal, April 2006
- Basis of Design, Quarry Final Cover, December 2003
- Basis of Design, Main Plant Final Cover, November 2004
- Basis of Design, Kokomo and Wildcat Creeks, January 2006
- Basis of Design, Lagoon Area, April 2006
- Basis of Design, Slag Processing Area, May 2004

IV. History and Cleanup Actions - Markland Quarry

Markland Quarry is a former limestone quarry used until the early 1980s by Continental Steel to dispose of steel processing waste. The approximately 23-acre quarry area is bordered by Harrison Street, Markland Avenue, Courtland Avenue, and Brandon Street. Most of the quarry is filled with slag, refractory brick, pig iron, baghouse dust, and possibly drums. Over 400 drums, several tanks and other wastes were scattered across the property. Drums containing oils, solvents, and refuse, were disposed in the quarry pond. The area is overgrown with shrubs and trees and is fenced. The pond is mostly filled with water.

Immediate Removal Actions 1990-1994: In February 1990, U.S. EPA began to collect, stage, analyze, and dispose of drums from the site. U.S. EPA removed surface soil contaminated with polychlorinated biphenyls (PCBs) from the former drum staging area, over-packed, sampled, and disposed of surface drums, and constructed a containment berm.

U.S. EPA and IDEM sampled soil gas and indoor air in the area in 2004, and sampled indoor air in selected homes in 2005. U.S. EPA sampled quarry sediments in 2004 to determine if they could be treated with zero-valent iron, and sampled sediments again in late 2004 to verify the levels of trichloroethylene (TCE) in the sediment. *Contaminants in surface water, ground water and soil still pose risks in this area, to be addressed during the final remedial action.*

V. History and Cleanup Actions - Main Plant Area

The Main Plant is bordered by West Markland Avenue, Leeds Street, Park Avenue, and Wildcat Creek. The plant produced nails, wire, and fence from scrap metal. Operations included reheating, casting, rolling, drawing, pickling, annealing, hot-dip galvanizing, tinning, and oil tempering of steel. Continental Steel used, handled, treated, stored, and disposed of hazardous materials throughout its operational history. More than 700 oil and solvent-filled drums were scattered through the area, and 55 aboveground storage tanks and underground storage tanks and 33 vats that contained oil and some chlorinated solvents and acids were located there. PCB transformers and capacitors, electric arc furnace dust, and asbestos were also at the Main Plant Area.

Immediate Removal Actions 1990-1994: Beginning in 1990, U.S. EPA removed seven underground storage tanks and various chemicals from a laboratory. In May 1990, U.S. EPA staged and sampled drums, sampled tank contents, and disposed of the liquids. U.S. EPA analyzed capacitor and transformer oils and drained and disposed of them.

In August 1993, U.S. EPA sampled the Main Plant Area for PCBs, polycyclic aromatic hydrocarbons (PAHs), asbestos and lead. U.S. EPA removed lead from several buildings, containerized approximately 90 cubic yards of lead-contaminated dust, and stockpiled and covered lead-contaminated debris. They identified asbestos in buildings. U.S. EPA sampled sewers, drained acid from a tank, and disposed of the acid

off-site. In October 1993, U.S. EPA excavated and disposed off-site one cubic yard of PCB-contaminated soil from the western Main Plant. Drums collected from previous removal efforts were disposed off-site.

In fall of 1994, U.S. EPA emptied and cleaned several aboveground storage tanks. Others were emptied, but not cleaned.

Non-time Critical Removal Action - Residential Soil Removal Action 1998-1999: IDEM excavated lead-contaminated residential surface soil to address the threat to human health, and placed it in an off-site landfill. IDEM stockpiled soil suitable for industrial use in the Slag Processing Area. IDEM then backfilled yards with clean soil and restored them.

Interim Remedial Action - Decontamination and Demolition of Main Plant Buildings, 1999-2000: In 1995, IDEM determined that the Main Plant Area buildings presented a potential risk to nearby residents and trespassers. IDEM completed decontamination and demolition of 125 buildings and structures and disposal of associated wastes in December 2000.

Final Remedial Action: In 2006, IDEM removed 12 underground storage tanks and associated wastes, and 676 cubic yards of buried asbestos containing material, and began constructing the final contaminated soil consolidation and cover. *Completion of this remedy will address the remaining contaminated soil. Ground water will be addressed by another part of the remedial action.*

VI. History and Cleanup Actions - Acid Lagoon Area

The Acid Lagoon Area is located approximately 0.3 miles west of the Main Plant Area, bordered by Wildcat Creek, the City of Kokomo wastewater treatment plant, and Markland Avenue. The 56 acres contains 10 lagoons that received processing waste including spent pickling and finishing liquors (sulfuric acid) from the Main Plant. The Acid Lagoon Area is fenced. The lagoons retain surface water from rainfall.

Interim Resource Conservation and Recovery Act (RCRA) Closure Action. 1989-1990: IDEM neutralized waste sulfuric acid stored in open lagoons in the Acid Lagoon Area, and placed neutralized sludge back into the lagoons.

In 2006, U.S. EPA constructed a lined drainage/dewatering facility on top of Lagoon 6, to drain water from sediments from Kokomo Creek and Wildcat Creek. U.S. EPA completed soil and sludge borings in the area to collect information to design the in-place closure of all the lagoons. *Contaminated ground water, soil and sludge remain at the site, and the former wastewater treatment building contains exposed asbestos.*

VII. History and Cleanup Actions - Slag Processing Area

Slag was processed and disposed in the Slag Processing area along Markland Avenue about 0.2 miles west of the Lagoon Area. The nine-acre area is bounded by Markland Avenue, Wildcat Creek, and the Acid Lagoon Area. An unknown amount of slag was placed here. The slag consisted primarily of calcium and iron oxides with some aluminum, chromium, lead, manganese,

magnesium, and zinc oxides. The area is unfenced and contains exposed slag. The area also contains a stockpile of lead-contaminated soil removed from residential yards. This soil is acceptable for use in industrial areas. *Risks posed by direct contact with the slag and soil are to be addressed during the final remedial action.*

VIII. History and Cleanup Actions – Ground Water

Ground water beneath CSSS appears to have received contaminants from the Main Plant Area, the Markland Avenue Quarry, the Acid Lagoon Area, other areas related to the site and possibly from other industrial facilities. The Kokomo/Howard County Council adopted a zoning ordinance in 2005 that restricts the use of contaminated ground water. *Ground water in the affected area is not suitable for drinking.*

IX. History and Cleanup Actions - Kokomo and Wildcat Creeks

Kokomo and Wildcat creeks run along the borders of the Main Plant and Acid Lagoon Areas. The creeks received water from the plant's wastewater recycling and filtration system, neutralized pickle liquor from the Acid Lagoon Area, discharge from outfalls, and stormwater run-off from the site.

In 1992, U.S. EPA removed buried drums and contaminated soil from creek banks by the Acid Lagoon Area. A fish consumption advisory warns that no fish caught in this area of Wildcat Creek in any amounts should be eaten. Pre-dredge sampling began in January 2006. *Contaminated sediment removal is expected to be complete in 2007. The removal will eliminate risks from direct contact with sediment; however, IDEM and U.S. EPA expect it will take several years for contaminant levels to drop significantly in fish, so the fish consumption advisory will remain in place until that occurs.*

X. Final Remedial Action

The final remedial action (RA) will address contamination remaining in all areas of the site. A proposed plan was presented to the public in March 1997, and the RA selection was documented in the Record of Decision (ROD) signed by IDEM and U.S. EPA on September 30, 1998. The ROD was amended in 2003, and changed further through an Explanation of Significant Differences (ESD) in 2005. The RA is currently in the construction phase. The RA will include:

- Excavation of contaminated soils and sediment;
- Off-site disposal of volatile organic compound (VOC) contaminated soil from the Acid Lagoon Area and sediments from Kokomo and Wildcat creeks and Markland Quarry;
- In-place closure of acid storage and treatment lagoons and sludge storage lagoons in the Acid Lagoon Area;
- In-place treatment of VOC contaminated soil in Main Plant Area;
- Two-foot compacted soil cover with vegetation over all areas where contamination is left in place;
- Institutional controls;
- Extraction with wells and treatment as needed of shallow and intermediate aquifer ground water;
- Continued pumping at Martin Marietta quarry; and,
- Monitored natural attenuation of ground water in the deep aquifer.

XI. Table 1 - Chronology of Site Events

The following table provides a chronological listing of events at CSSS.

March 1989	Based on preliminary investigations, Acid Lagoon Area placed on the National Priorities List (NPL), also known as Superfund. The Main Plant Area and the Markland Quarry were added shortly thereafter.
August 1989	U.S. EPA Technical Action Team inspected site for possible removal actions.
October 1989	IDEM contractor began removing and disposing of pickle liquor from Acid Lagoon Area. Lime was added to the pickle liquor. Treated liquor was discharged to the City of Kokomo wastewater treatment plant.
February 1990	U.S. EPA began removing surface drums from Markland Avenue Quarry. A berm was constructed to inhibit off-site migration of contaminated water.
March 1990	U.S. EPA and IDEM inspected Main Plant Area for possible removal actions.
April 1990	U.S. EPA conducted an underwater investigation of Markland Avenue Quarry. Roughly 1,000 drums were found. Sampling was conducted.
May 1990	U.S. EPA removed drums, tank contents, capacitors and transformers from Main Plant. Removed over 200 chemicals from metallurgical lab. Drum disposal was on-going.
June 1990	The IDEM contractor completed treatment and discharge of pickle liquor in Acid Lagoon Area.
November 1990	IDEM conducted preliminary assessment of Dixon Road Quarry. The assessment indicated potential contamination.
June 1991	U.S. EPA began removal of over 1,100 submerged drums from Markland Avenue Quarry pond.
May 1992	Some U.S. EPA time critical removal actions (TCRAs) completed. Community interviews conducted to develop a community relations plan.
December 1992-February 1993	An estimated 1350 buried drums and 1250 cubic yards of contaminated soil removed from the bank of Wildcat Creek at the Acid Lagoon Area.
August 1993	Main Plant Area sampled for polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), asbestos, and lead; removed lead from buildings; consolidated and contained on site approximately 90 cubic yards of lead-contaminated dust; separated, stockpiled and covered for future disposal hundreds of cubic yards of lead-contaminated debris. Confirmed asbestos presence. U.S. EPA sampled sewers and drained acid from tank T-18, disposed of acid off-site.
October 1993	About 121 cubic yards of PCB-contaminated soil excavated from western portion of Main Plant Area, disposed off-site. Drums collected during the 1993 removal stored and later disposed off-site.
1993	Phase I of Remedial Investigation completed. (Acid Lagoon Area, Kokomo and Wildcat creeks, site-wide ground water.)
Fall 1994	U.S. EPA removed contents and cleaned aboveground storage tanks in Main Plant. Tanks T-14 and T-15 emptied, but not cleaned.
December 1994	IDEM reported one residential well to U.S. EPA that had been contaminated by trichlorethylene (TCE).
March 1995	U.S. EPA installed an air stripper on the residential well.
1995	Phase II of Remedial Investigation completed (Markland Avenue Quarry, Main Plant Area, Slag Processing Area and data gaps for Phase I with regard to site-wide ground water, the Acid Lagoon Area and Kokomo and Wildcat creeks.

June 1996	Indiana State Department of Health performed environmental radiation surveys in Slag Processing Area, Acid Lagoon Area, and the former laboratory area in the Main Plant Area. No evidence of gross radiological contamination.
September 1996	**Interim Record of Decision signed by IDEM and U.S. EPA to decontaminate and demolish buildings in Main Plant Area.**
July 1997	IDEM proposed removal of lead contaminated soils from residential yards east of the Main Plant Area.
April 1997	**Action Memorandum determines need to remove contaminated soils in residential area. Final Proposed Plan presented to the National Remedy Review Board for approval.**
February 1998 to March 1998	First public comment period for the final Record of Decision for all six Operable Units.
April 1998 to May 1998	Second public comment period for final Record of Decision for all six Operable Units.
May 5, 1998	Removal of residential soils began.
September 1998	**Final Record of Decision signed for all six Operable Units. Marks completion of investigation and describes cleanup actions.**
December 1998	Removal of lead contaminated residential soils completed.
April 1999	IDEM began decontamination and demolition of Main Plant Area buildings with asbestos survey.
December 28, 2000	IDEM completed decontamination and demolition of Main Plant Area buildings.
August 2001	Field investigative activities for remedial design completed.
July 2001	Basis of Design plans for Slag Processing Area (proposed firing range scenario) completed. Implementation held pending local land use approval.
November 14, 2001	Explanation of Significant Differences (ESD) presented at IDEM public meeting.
December 14, 2001	Public comment period for ESD closes.
March 28, 2002	ESD signed by IDEM and U.S. EPA.
April 2002	Pre-final basis of design plans for Acid Lagoon Area (corrective action Management unit (CAMU) construction) submitted.
May 20-21, 2002	Community interviews held for five year review.
June 11, 2002	IDEM began weed control and fence maintenance measures in Main Plant Area.
June 13, 2002	Public availability sessions held for five year review.
June 24, 2002	U.S. EPA completed repairs to residential soil pile in Slag Processing Area.
July 2002	Preliminary basis of design plans for Main Plant Area submitted.
March 27 until April 30, 2003	Public comment period for Record of Decision amendment. IDEM public meeting held March 27.
September 26, 2003	Record of Decision amendment completed.
August 15 until September 15, 2005	Public comment period for ESD. IDEM public meeting August 24.

September 30, 2005	ESD completed. Eliminated CAMU from the remedy and made other remedy changes.
March 28 until July 5, 2006	Removal of underground storage tanks and buried asbestos containing materials from Main Plant Area; includes timeframe from pre-construction meeting until completion of construction.
January 16 to April 17, 2006	Construction of dewatering facility in Acid Lagoon Area.
December, 2006	Pre-dredge sampling in Kokomo and Wildcat creeks began.
June 20-24, 2005	Pretreatment sampling for Main Plant final cover by IDEM and U.S. EPA.
August 28 to September 1, 2006	Pretreatment sampling for Main Plant final cover by Keramida Environmental.
November 27, 2006	Mobilization for construction of Main Plant final cover.

XII. Acronyms

The following table provides a list of acronyms for terms found in this fact sheet and other CSSS documents.

AST	Aboveground storage tank
ATSDR	Agency for Toxic Substances and Disease Registry
BRA	Baseline risk assessment
CAMU	Corrective action management unit (landfill)
CERCLA	Comprehensive Environmental Response, Compensation and Liabilities Act
CFR	Code of Federal Regulations
CSSS	Continental Steel Superfund Site
EM	Electro-magnetic
ESD	Explanation of significant differences
IDEM	Indiana Department of Environmental Management
NCP	National Contingency Plan
NPL	National Priorities List
PAHs	Polycyclic aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
RA	Remedial action
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
TCE	Trichlorethelene
TCRA	Time critical removal action
U.S. EPA	U.S. Environmental Protection Agency
UST	Underground storage tank
VOC	Volatile organic compound

XIII. FOR MORE INFORMATION

Anyone interested in learning more about the remedial investigation, the five year review process or the Superfund program is encouraged to review other documents related to the site.

An administrative record, including the information IDEM relied upon to choose the cleanup actions, is maintained at these locations:

- Information Repository
Kokomo/Howard County Public Library
Genealogy Section
220 North Union Street
Kokomo, IN

- IDEM Central File Room
Indiana Government North Building
100 North Senate Avenue, Room 1201
Indianapolis, IN 46204
(The Central File Room is open Monday through Friday, excluding official holidays, between the hours of 8:15 a.m. and 4 p.m., local time. Individuals who plan to visit IDEM to review these documents should call the Central File Room at (317) 232-8667 to make arrangements beforehand.)

- All documents and data are also available electronically, on the IDEM Web site, at:
http://www.in.gov/idem/programs/land/federal/index.html

For assistance with questions or special accommodations, please contact the following individuals:

Project Manager:
Pat Likins
Indiana Department of Environmental Management
100 North Senate Avenue
MC 66-31 IGCN1101
Indianapolis, IN 46204-2251
Telephone: (317) 234-0357
Toll free: (800) 451-6027
E-mail: plikins@idem.IN.gov

Media Contact:
Amy Hartsock
Public Information Officer
IDEM Office of External Affairs
Telephone: (317) 233-4927
Toll free: (800) 451-6027
E-mail: ahartsoc@idem.IN.gov

ADA Information: Individuals requiring reasonable accommodations for participation at the public meeting should call the Americans with Disabilities Act coordinator at (317) 232-4555, (V-TTY) or write to:

Coordinator
Indiana State Personnel Department
402 W. Washington Street
Indianapolis, IN 46204
ATTN: Lavenia Haskett, ADA

Please provide a minimum of 72 hours notification.

Community interview sheet/Continental Steel Superfund Site

Please tell us a little about yourself:

_____

Name

_____ _____

Address (*optional*) Phone (*optional)*

☐ Private individual
☐ Nearby business representative
☐ Local Labor representative
☐ City/ County elected official
☐ Environmental group representative
☐ City/County agency, department or organization representative
☐ Kokomo resident

How many years have you lived here?

☐0-5 years ☐5-10 years ☐10-20 years ☐20-30 years ☐more than 30 years

☐ Not a resident of the Kokomo area

What is your main concern about the Continental Steel site?

_____

_____

Do you use Kokomo or Wildcat creeks for:

☐ Fishing, catch & release ☐ Fishing, catch & eat ☐ Wading ☐ Boating

Are you aware of the Fish Consumption Advisory?

☐ Yes ☐ No

Do you use a well for drinking water? (If yes, please give us your address)

☐ Yes ☐ No

If yes, please provide your address:_____

Do you feel that the site poses risks now to members of the community?

☐ Yes ☐ No ☐ Unsure

If you have a question or problem with the site, do you know whom to contact?

☐ Yes ☐ No

Do you think that community understanding and concern about the site is strong enough to impact the quality of the investigation and cleanup?

☐ Yes ☐ No ☐ Some

How do you feel about the rate of the investigation and cleanup?

☐ Good or okay ☐ Slow ☐ Other

Community interview sheet/Continental Steel Superfund Site (continued)

What do you think might be the reason(s) for the time involved?

_____

_____

How would you rate your understanding of the Superfund process?
☐ Very good ☐ Medium ☐ Poor

Have information updates been frequent enough?
☐ Yes ☐ No

How would you suggest that we improve communication?

_____

_____

Do you feel that news media is reliable?
☐ Yes ☐ No ☐ Sometimes

What do you think is the best way to reach you with factual information?
☐ Fact sheets /mailings ☐ E-mail ☐ Radio
☐ Newspaper ☐ Meetings ☐ Individual interviews

Please choose your top 4 sources of information, and rank them 1-4.

____*Fact sheets (from IDEM or U.S. EPA)
____*Public meetings
____*Newspaper
____*City/County Officials
____Information repository (library)
____Community/church organizations
____City or County internet web sites
____IDEM internet web site
____Other
____Neighborhood associations
____Radio
____Television
____Labor organization
____Civic/community meetings
____Other elected representatives

* *These were the top sources of information identified in community interviews during the 2002 five year review.*

Are you concerned about the cost of the cleanup to taxpayers?
☐ Yes ☐ No

Do you have any suggestions?

_____

_____

Do you have any other comments or concerns?

_____

_____

_____

APPENDIX A
1998 RECORD OF DECISION ARARS

APPENDIX A - 1998 RECORD OF DECISION ARARS

This section presents a summary of those federal regulations which may be found to be applicable or relevant and appropriate to the CSSS, specifically:

- CERCLA, including the Superfund Amendments and Reauthorization Act (SARA) of 1986 and subsequent amendments;
- RCRA, including the Hazardous and Solid Waste Act Amendments of 1984 (HSWA);
- The Toxic Substances Control Act (TSCA);
- The Clean Water Act (CWA) and Amendments;
- The Safe Drinking Water Act (SDWA);
- The Clean Air Act (CAA);
- The Protection of Wetlands/Flood Plains Management Executive Order; and
- The Hazardous Materials Transportation Act.

The Comprehensive Environmental Response, Compensation, and Liability Act

CERCLA, last amended in October 1992, provides the U.S. EPA administrator the authority to respond to any past disposal of hazardous substances and any new uncontrolled releases of hazardous substances. Within CERCLA, a trust fund has been established for clean-up of abandoned past disposal sites and leaking underground storage facilities, as well as the authority to bring civil actions against violators of this act. The National Contingency Plan (NCP), which guides clean-up actions at Superfund sites, was developed subject to this act.

The Superfund Amendments and Reauthorization Act (SARA) of 1986 extensively amends CERCLA. The major goals of SARA were to include more public participation, and to establish more consideration of State clean-up standards, with an emphasis on achieving remedies that permanently and significantly reduce the mobility, toxicity, or volume of wastes.

The Resource Conservation and Recovery Act

RCRA regulates the management and land disposal of hazardous waste and solid waste material and the recovery of materials and energy resources from the waste stream. RCRA regulates the generation, transportation, treatment, storage, and disposal of hazardous wastes, as well as solid waste disposal facilities. RCRA applies to RAs selected that include disposal, treatment, storage, or transportation of regulated wastes. Remedies that include on site disposal of hazardous wastes will be required to meet RCRA design, monitoring, performance and closure standards. Off-site transportation of regulated wastes, whether as part of a RA or as generated during the investigation, will require use of the manifest system, a RCRA-licensed transporter, and proof of acceptance at a licensed facility approved for the particular wastes.

The Hazardous and Solid Waste Act Amendments (HSWA) of 1984 impose new and more stringent requirements on hazardous waste generators, transporters, and owner/operators of treatment, storage, and disposal facilities. Land disposal restrictions, as described in 40 CFR 268,

identify hazardous wastes that are restricted from land disposal and define those limited circumstances under which an otherwise prohibited waste may continue to be land disposed.

For the CSSS, the lagoons are RCRA surface impoundments. Therefore, closure of the lagoons should consider these design requirements.

The Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) regulates the remediation of soils contaminated with PCBs under 40 CFR 761.125(c)(4). TSCA requires that material contaminated with PCBs at concentrations of 500 mg/kg or greater be incinerated or treated by an alternate method that achieves a level of performance equivalent to incineration. Alternate treatments other than incineration must achieve a waste soil residual concentration of less than two mg/kg. Liquids at concentrations above 50 mg/l but less than 500 mg/l and soils contaminated above 50 mg/kg may also be disposed of in a permitted chemical waste landfill. In addition, TSCA storage requirements for PCB materials with PCB concentrations of 50 mg/kg or greater prior to disposal would be applicable. Soils contaminated with PCBs in human exposure areas are to be treated or removed such that the PCB concentration in the upper 10 inches of soil is less than one mg/kg, and the concentration below 10 inches is less than 10 mg/kg.
U.S. EPA issued a proposed rule on December 6, 1994 regarding the disposal of PCBs. This proposed rule provides for disposal of non-liquid PCB remediation waste generated by the clean-up process at their existing concentration (i.e., at a concentration less than the maximum concentration of PCBs found at the remediation waste site). The proposed regulations also provide for a risk-based remediation option which bases disposal requirements for PCB remediation waste on the potential risks to health and the environment resulting from residual PCBs in the PCB-remediation waste.

The Clean Water Act

The Federal Water Pollution Control Act, amended by the Clean Water Act of 1977, was last amended October 1992, and is commonly referred to as the Clean Water Act (CWA). Federal Ambient Water Quality Criteria documents have been published for 65 priority pollutants listed as toxic under the CWA. These criteria are guidelines that may be used by states to set surface water quality standards. Although these criteria were intended to represent a reasonable estimate of pollutant concentrations consistent with the maintenance of designated water uses, states may appropriately modify these values to reflect local conditions. Under SARA, however, RAs must attain a level or standard of control that will result in surface water conditions equivalent to these criteria unless a waiver has been granted.

The water quality criteria are generally represented in categories that are aligned with different surface water use designations. These criteria represent concentrations that, if not exceeded in surface water, should protect most aquatic life against acute or chronic toxicity. For many chemical compounds, specific criteria have not been established because of insufficient data. The criteria are used to calculate appropriate limitations for discharges to surface water. These limitations are incorporated in the National Pollutant Discharge Elimination System (NPDES) permits.

The provisions of the CWA are potentially applicable to uncontrolled landfill leachate and groundwater discharges to surface water bodies and to RAs that include a discharge of treated water to surface water.

The Safe Drinking Water Act

The Safe Drinking Water Act of 1974 (SDWA), regulates the quality of water collected, distributed, or sold for drinking purposes. Standards are set for maximum contaminant levels (MCLs) permissible in water delivered to any user of public drinking water. The SDWA also has been broadened to protect groundwater and public drinking water supplies against contamination.

National primary drinking water standards established under the SDWA are promulgated as MCLs that represent the maximum allowable levels of specific contaminants in public water systems. MCLs are generally based on lifetime exposure to the contaminant for a 70 kg (154 pound) adult who consumes two liters (0.53 gallons) of water per day.

The SDWA provides for primary drinking water regulations to be established for maximum contaminant level goals (MCLGs), with MCLs as close to MCLGs as feasible. MCLGs are non-enforceable health goals at which no known or anticipated adverse effects on the health of persons would be expected to occur, thus allowing an adequate margin of safety. MCLGs only serve as goals for U.S. EPA in the course of setting MCLs and, therefore, are initial steps in the MCL rule-making process.

MCLs and MCLGs for contaminants of concern at the CSSS were established in the final Risk Assessment (CDM, 1996).

The Clean Air Act

The Clean Air Act (CAA), with amendments through December 1991, was enacted to protect and enhance the quality of air resources to protect the public health and welfare. The CAA is intended to initiate and accelerate national research and development programs to achieve the prevention and control of air pollution. Under the CAA, the Federal Agencies are to provide technical and financial assistance to state and local governments for the development and execution of their air pollution programs. The U.S. EPA is the administrator of the Act and is given the responsibility to meet the objectives of the Act. The Act establishes emission levels for certain hazardous air pollutants that result from treatment processes.

Requirements of the CAA are potentially applicable to RAs that result in air emissions, such as excavation and treatment activities.

The Protection of Wetlands/Flood Plain Management Executive Order

Executive Order 11990 requires Federal agencies in carrying out their responsibilities, to take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The order emphasizes the importance of the initiation of new construction located in wetlands unless there is no practicable alternative to that construction. The order also emphasizes minimizing the harm to the wetlands if the only practicable alternative requires construction in the wetland. The order requires that federal agencies provide early and adequate opportunities for public review of plans and proposals involving new construction in wetlands.
Executive Order 11988 requires federal agencies carrying out their responsibilities to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by flood plains. This order emphasizes the importance of evaluating alternatives to avoid adverse effects and incompatible development in flood plains, minimizing the potential harm to flood plains if the

only practicable alternative requires siting an action in a flood plain, and providing early and adequate opportunities for public review of plans and proposals involving action in flood plains such as the Acid Lagoon Area.

Appendix A of 40 CFR Part 6 describes the requirements for flood plain/wetlands review of proposed U.S. EPA actions. These regulations are potentially applicable for work to be done in the creeks or other wetland areas, and for remedial activities within the flood plain, such as the Acid Lagoon Area.

The Hazardous Materials Transportation Act

The Hazardous Materials Transportation Act (HMTA) of 1981, as amended, was enacted to regulate the shipping, marking, labeling, and placarding of hazardous materials that are transported on public roadways. Pursuant to the HMTA, the Department of Transportation (DOT) has promulgated regulations pertaining to transportation of hazardous materials. DOT also has jurisdiction over the packaging of hazardous materials prior to shipment.

Hazardous soils, residues, wastewaters, or wastes that are transported off-site from the CSSS will be handled according to HMTA and DOT regulations.

Identification of Potential State ARARs for the CSSS

The purpose of this section is to identify ARARs that exist based on Indiana state regulations that must be complied with when performing a RA. The agency charged with developing and enforcing environmental regulations for Indiana is the IDEM.

Indiana Water Quality Standards (IAC Title 327)

These regulations pertain to all waters in the state and are intended to restore and maintain the chemical, physical, and biological integrity of the waters of the state. The regulations include:

- Specific water quality standards and minimum treatment requirements that apply to all waters of the state. These include minimum surface water quality standards and interim groundwater quality standards;
- Regulations applying to industrial wastewater programs (NPDES);
- Regulations applying to municipal wastewater treatment facilities;
- Regulations applying to industrial wastewater discharges into sewage treatment plants; and
- Water quality standards for water distributed through public water supply systems.

The procedures for developing water quality criteria based on toxicity are included in IAC Title 327, as are procedures for evaluating the characteristics of receiving waters. These procedures are used to determine discharge concentrations which if not exceeded will maintain the quality of the receiving waters.

Indiana Solid Waste Management Board Rules (IAC Title 329)

These regulations specify requirements that apply to solid waste and hazardous waste facilities. These include Solid Waste Management Requirements, Hazardous Waste Management Permit Program and Related Hazardous Waste Management Requirements, PCB Waste Management Requirements. The solid waste regulations include design and disposal regulations as well as monitoring requirements and standards for groundwater protection applicable to solid waste land disposal facilities. The hazardous waste regulations were developed pursuant to the requirements of RCRA and pertain to generators and transporters of hazardous waste and owners or operators of hazardous waste facilities. The PCB waste management requirements were developed based on the requirements of TSCA and pertain to the handling and disposal of PCB containing wastes which exceed 50 ppm, and in certain cases, regulate PCBs at concentrations between 2 ppm and 50 ppm.

Indiana Air Pollution Control Regulations (IAC Title 326)

The Indiana air pollution control regulations were developed pursuant to the Federal CAA. The regulations contain specific emission levels and requirements for monitoring emissions. They contain requirements for specific types of operations (such as burning) and for types of industry. There are also specific emissions standards for hazardous air pollutants.

Chemical-Specific Requirements

Federal

(1)Clean Air Act (42 USC 7401 et seq.), National Primary and Secondary Ambient Air Quality Standards (40 CFR 50) [U.S. EPA regulations on National Primary and Secondary Ambient Air Quality Standards].

(2)Clean Air Act (42 USC 7401 et seq.), National Emission Standards for Hazardous Air Pollutants (40 CFR 61), Subpart M, National Emission Standards for Asbestos. [Standards for demolition and renovation, asbestos waste disposal].

(3)Clean Water Act (33 USC 1251, et seq.), Water Quality Standards (40 CFR 131) [U.S. EPA regulations on establishing water quality standards].

(4)Safe Drinking Water Act (42 USC 300f, et seq.), Maximum Contaminant Levels (40 CFR 141.11 - 141.16) [Sets standards for contaminants in public drinking water supplies].

(5)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Land Disposal Restrictions (40 CFR 268) Subpart D, Treatment Standards [Sets the treatment standards for waste extract, specified technology, hazardous waste debris].

(6)Solid Waste Disposal Act, (15 USC 6901, et seq.), Identification and Listing of Hazardous Waste (40 CFR 261) Subpart B, Criteria for Identifying the Characteristics of Hazardous Waste and for Listing Hazardous Waste [Sets criteria for identifying a hazardous waste].

(7)Solid Waste Disposal Act, (15 USC 6901, et seq.), Identification and Listing of Hazardous Waste (40 CFR 261) Subpart C, Characteristics of Hazardous Waste [Identifies the characteristics of a hazardous waste].

(8)Solid Waste Disposal Act, (15 USC 6901, et seq.), Identification and Listing of Hazardous Waste (40 CFR 261) Subpart D, List of Hazardous Waste [List of hazardous waste from sources].

(9)Toxic Substances Control Act, as amended (15 USC 2607-2629; PL 94-469 et seq.), Polychlorinated Biphenyl (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions (40 CFR 761), Subpart G, PCB Spill Clean-up Policy [Sets clean-up standards for PCB-contaminated materials].

State

(10)Air Pollution Control Board (Title 326), Article 6 - Particulate Rules, Fugitive Dust Emissions (326 IAC 6-4) [Sets emission limitations for particulate].

(11)Air Pollution Control Board (Title 326), Article 2 – Permit Review Rules (326 IAC 2-1) [Lists general provisions for major new sources, including ambient air quality standards. New sources which have the potential to emit any air pollutant must apply for a permit].

(12)Air Pollution Control Board (Title 326) Article 8 - Volatile Organic Compound Rules (326 IAC 8 - 6) [Sets criteria that sources which become subject to the rule within Article 8 under any other rule applicability section in Article 8. Requires recordkeeping, reporting and restrictions when applicable].

(13)Air Pollution Control Board (Title 326), Article 14 - Emission Standard for Hazardous Air Pollutants, Emission Standards for Sources of Asbestos Listed in Section 1 of this Rule (326 IAC 14-2) [Presents a list of asbestos sources subject to federal standards].

(14)Solid Waste Management Board (Title 329), Article 10 - Solid Waste Management, Solid Waste Land Disposal Facility Classification (329 IAC 10-9) [Describes construction/demolition sites waste criteria and restricted waste sites waste criteria].

(15)Solid Waste Management Board (Title 329), Article 10 - Solid Waste Management, Special Waste (329 IAC 10-8.2 Management Requirements for Certain Solid Wastes) [Describes certain solid waste that must be managed using handling or disposal requirements described in the rule].

(16)Solid Waste Management Board (Title 329), Article 3.1 - Hazardous Waste Management Permit Program and Related Hazardous Waste Management, Identification and Listing of Hazardous Waste (329 IAC 3.1-6) [Sets list and exemptions of hazardous waste].

(17)Solid Waste Management Board (Title 329), Article 4.1 - PCB Waste Management (329 IAC 4-1) [Sets requirements for the disposal of PCBs at concentrations which exceed 50 ppm and separate requirements for those containing between 2 ppm and 50 ppm].

(18)Water Pollution Control Board (Title 327), Article 2 - Water Quality Standards (327 IAC 2-1-6, 2-1-1.5 and 2-11) [Sets requirements for Water Quality Effluent and includes minimum Surface Water Quality Standards and Groundwater Quality Standards].

(19)Water Pollution Control Board (Title 327), Article 8 - Public Water Supply (327 IAC 8-2) [Sets standards for drinking water].

Location-Specific Requirements

Federal

(20)Clean Water Act, (33 USC 1251, et seq.), Permits for Dredge or Fill Material (Section 404) [Requires that no activity that adversely affects a wetlands shall be permitted if a practicable alternative that has less effect is available].

(21)Fish and Wildlife Coordination Act (16 USC 661, et seq.) [Requires that any federal agency that proposes to modify a body of water must consult U.S. Fish and Wildlife Services].

(22)National Environmental Policy Act (42 USC 4321) Executive Order 11990, Protection of Wetlands [Requires federal agencies to minimize the destruction, loss, or degradation of Wetlands and preserve].

(23)National Environmental Policy Act (42 USC 4321) Executive Order 11988, Floodplain Management [Requires federal agencies to reduce the risk of flood loss, to minimize impact of floods, and to restore and preserve the natural and beneficial value of flood plains].

(24)National Environmental Policy Act (42 USC 4321) Statement of Procedures on Floodplain Management and Wetland Protection (40 CFR 6) Appendix A to Part 6 [Promulgates Executive Orders 11988 and 11990 regarding wetlands and flood plains].

(25)Solid Waste Disposal Act (42 USC 6901, et seq.), Solid Waste Subpart B, Location Standards (40 CFR 264.18) [Sets requirements for constructing a RCRA facility on a 100-year flood plain].

(26)Flood Control Act (IC 14-28-1), [Requires formal approval for any construction, excavation or filling in the floodway outside of the Superfund boundary].

(27)Water Resources Management Act (IC-14-25-7) [Requires registration of any significant water withdrawal facility with the Department of Natural Resources. A significant water withdrawal facility is defined as any water withdrawal facility that, in the aggregate from all sources and by all methods, has the capacity to withdraw more than 100,000 gallons of groundwater or surface water or a combination of the two in one day. This would also include any potable pumps employed by the facility].

State

(28)Air Pollution Control Board (Title 326), Article 2 - Permit Review, Construction Permits (326 IAC 2-1.1) [Sets requirements for obtaining a permit prior to construction or modification].

(29)Solid Waste Management Board (Title 329) Article 10-16-3 - Wetlands Siting Restrictions. [Prohibits solid waste boundary of new solid waste land disposal facility from wetlands in violation of Section 404 of the Clean Water Act, as amended and within the floodplain unless the waste is protected from flood water inundation by a dike; establishes design standards for construction/demolition sites and restricted waste sites].

Action-specific Requirements

Federal

(30)Clean Air Act, (42 USC 740 et seq.), National Primary and Secondary Ambient Air Quality Standards (40 CFR 50) [Specifies maximum primary and secondary 24-hour concentrations for particulate matter].

(31)Clean Water Act, (33 USC 1251, et seq.), Permits for Dredge or Fill Material (Section 404) [Provides requirements for discharges of dredged or fill material. Under this requirement, no activity that affects a wetland shall be permitted if a practicable alternative that has less impact on the wetland is available. If there is no other practicable alternative impacts must be mitigated. A Section 401 water quality certification may be required from IDEM if wetlands or other waters of the state are impacted].

(32)Department of Transportation Rules for Transportation of Hazardous Materials, (49 CFR Parts 107, 171.1 - 171.5) [Outlines procedures for the packaging, labeling, and transporting of hazardous materials].

(33)Noise Control Act, as amended (42 USC 4901, et seq.); Noise Pollution and Abatement Act (40 USC 7641, et seq.), Noise Emission Standards for Construction Equipment (40 CFR 204) [The public must be protected from noise that jeopardize health and welfare].

(34)Protection of Archeological Resources (32 CFR Part 229, 229.4; 43 CFR Parts 107, 171.1 - 171.5) [Develops procedures for the protection of archeological resources].

(35)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Guideline for the Land Disposal of Solid Wastes (40 CFR 241), Part B - Requirements and Recommended Procedures [Solid, nonhazardous wastes generated as a result of remediation must be managed in accordance with federal and state regulations; this is applicable to waste generated by the RA].

(36)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Standards for Hazardous Waste Generators (40 CFR 262) and Standards for Hazardous Waste Transporters (40 CFR 263); [General requirements for packaging, labeling, marking, and manifesting hazardous wastes for temporary storage and transportation offsite]. Any residues determined to be RCRA hazardous waste destined for offsite disposal are subject to manifest requirements. RAs involving offsite disposal of RCRA listed wastes will be subject to this requirement.

(36)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Interim Status Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities (40 CFR 265), Storage, and Disposal General Facility Standards, Subpart G, Closure and Post-closure. [Sets general requirements for closure of interim status hazardous waste management units].

(38)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities (40 CFR 265) Subpart K, Surface Impoundments. [Establishes requirements for closure and post-closure care of interim status surface impoundments].

(39)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Land Disposal Restriction-RCRA (40 CFR 268) [RCRA Land Disposal Restriction, defines hazardous waste debris. This

requirement is applicable to those RCRA hazardous wastes that will be disposed offsite. Land Disposal Restrictions will not apply to on-property disposal under the Corrective Action Management Unit (CAMU) Rule].

(40)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (40 CFR 280), Subpart G, Out-of-Service UST Systems and Closure, [Sets requirements for temporary and permanent UST closure, and assessing the site closure].

(41)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Standards for Owners and Operators of Hazardous Waste Treatment Storage, and Disposal Facilities (40 CFR 264), Subpart B, General Facility Standards; Subpart C, Preparedness and Prevention; Subpart D, Contingency Plan and Emergency Procedures; Subpart E, Manifest System, Record Keeping and Reporting [Establishes general requirements for storage and treatment facility location, design and inspection, waste compatibility determination, emergency contingency plans, preparedness plans, and worker training].

(42)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.),Standards for Owners and Operators of Hazardous Waste Treatment Storage, and Disposal Facilities (40 CFR 264) Subpart F, Releases from Solid Waste Management Units [Details requirements for a groundwater monitoring program to be installed at the site].

(43)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.),Standards for Owners and Operators of Hazardous Waste Treatment Storage, and Disposal Facilities (40 CFR 264) Subpart G, Closure and Post-Closure [Defines specific requirements for closure and post-closure of hazardous waste facilities].

(44)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Standards for Owners and Operators of Hazardous Waste Treatment Storage, and Disposal Facilities (40 CFR 264), Subpart I, Use and Management of Containers; Subpart J, Tank Systems; Subpart K, Surface Impoundments; Subpart L, Waste Piles; and Subpart N, Landfills. [Containers, surface impoundments, and landfills used to store hazardous waste must be closed and in good condition. Tank systems must be adequately designed and have sufficient structural strength and compatibility with the wastes to be stored or treated to ensure that it will not collapse, rupture, or fail, including secondary containment. Waste piles must be designed to prevent migration of wastes out of the pile into adjacent subsurface soil or groundwater or surface water at any time during its active life. Disposal of special wastes in landfills must be done in accordance with requirements].

(45)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Standards for Owners and Operators of Hazardous Waste Treatment Storage, and Disposal Facilities (40 CFR 264), Subpart DD, Containment Building. [Hazardous waste and debris may be placed in units known as containment buildings for the purpose of interim storage or treatment].

(46)Toxic Substance Control Act, as amended (15 USC 2607-2629; PL 94-469, et seq.), Polychlorinated Biphenyl (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions (40 CFR 761). Subpart D, Storage and Disposal [Provides requirements for storage and disposal of materials containing PCBs].

<u>The following is a list of potential ARARs for CAMUs at Superfund sites:</u>

(47)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Hazardous Waste Management System: General (40 CFR 260) Subpart B, Definitions [A CAMU shall only be used for the management of remediation wastes pursuant to implementing such corrective action requirements at the facility].

(48)Solid Waste Disposal Act, as amended (42 USC 6901, et seq.), Standards for Owners and Operators of Hazardous Waste Treatment Storage, and Disposal Facilities (40 CFR 264), Subpart S, Corrective Action Management Unit [Allows remediation waste treatment, storage, and disposal within a corrective action management unit, which can encompass one or more units or areas where contaminants are found].

The following is a list of potential ARARs for Superfund sites that discharge treated groundwater to Publicly Owned Treatment Works (POTW):

(49)Clean Water Act, (33 USC 1251, et seq.), National Pollutant Discharge Elimination System (NPDES) Permit Regulations [40 CFR part 122.42(b)] [Requires notification of issuing authority of re-evaluation of POTW pretreatment standards (it must be noted that in the event that the POTW does not have a local limitation for a particular pollutant found in the leachate from a Superfund site, it must re-evaluate its local limitations, and develop a limitation if necessary to protect the POTW from interference, pass-through, or contamination of the sewage sludge].

(50)Clean Water Act, (33 USC 1251, et seq.), National Pretreatment Standards (40 CFR Part 403.5) [Discharge to a POTW must not interfere, pass through untreated into the receiving waters, or contaminate sludge].

(51)Clean Water Act, (33 USC 1251, et seq.), National Pretreatment Program Requirements for POTWs [40 CFR Part 403.8(f)].

The following is a list of potential ARARs for Superfund sites that discharge treated groundwater to surface water bodies:

(52)Clean Water Act, (33 USC 1251, et seq.), NPDES Permit Regulations (40 CFR Part 122.21) [Permit application must include a detailed description of the proposed action including a listing of all required environmental permits].

(53)Clean Water Act, (33 USC 1251, et seq.), NPDES Permit Regulations (40 CFR Part 122.44) (Established limitations, standards, and other NPDES permit conditions including federally approved State water quality standards].

(54)Clean Water Act, (33 USC 1251, et seq.), NPDES Permit Regulations [40 CFR Part 122.44(a)] [Best Available Technology (BAT) for toxic and non-conventional wastewater or Best Conventional Technology (BCT) for conventional pollutants].
(55)Clean Water Act, (33 USC 1251, et seq.), NPDES Permit Regulations [40 CFR Part 122.44(b)] [Effluent Limitations and Standards requirements under Section 301, 302, 303, 307, 318, and 405 of the Clean Water Act (CWA)].

(56)Clean Water Act, (33 USC 1251, et seq.), NPDES Permit Regulations, Water Quality Standards and State Requirements [40 CFR Part 122.44(d)] [Water Quality Based Effluent Limitations (WQBELs), any requirements in addition to or more stringent that promulgated effluent limitations and guidelines or standards under Section 301, 304, 306, 307, 318, and 405 of the CWA].

(57)Clean Water Act, (33 USC 1251, et seq.), NPDES Permit Regulations, Technology Based Controls for Toxic Pollutants [40 CFR Part 122.44(e)] [Discharge limits established under paragraphs (a), (b), or (d) of 40 CFR Part 122.44 must be established for toxics to be discharged at concentrations exceeding levels achievable by the technology-based (BAT/BCT) standards].

(58)Clean Water Act, (33 USC 1251, et seq.), NPDES Permit Regulations [40 CFR Part 122.44(I)] [Requires monitoring of discharges to ensure compliance].

(59)Clean Water Act, (33 USC 1251, et seq.), NPDES Permit Regulations [40 CFR Part 125.100)] [The site operator must include a detailed description of the proposed action including a listing of all required environmental permits].

(60)Clean Water Act, (33 USC 1251, et seq.), (40 CFR Part 131) [States are granted enforcement jurisdiction over direct discharges and may adopt reasonable standards to protect or enhance the uses and qualities of State surface water bodies].

(61)Clean Water Act, (33 USC 1251, et seq.), (40 CFR Parts 136.1 - 136.4)[Requires adherence to sample preservation procedures including container materials and sample holding times].

(62)Fish and Wildlife Coordination Act, (16 USC 661, et seq.), [Requires that any federal agency that proposes to modify a body of water must consult the U.S. Fish and Wildlife Services].

State

(63)Air Pollution Control Board (Title 326), Article 14 - Emission Standard for Hazardous Air Pollutants, Emission Standards for Asbestos; Demolition and Renovation Operation (326 IAC 14-10) [Sets the notification requirements , procedures for asbestos emission control and demolition fees for demolition projects where asbestos may be present].

(64)Solid Waste Management Board (Title 329), Article 3.1 - Hazardous Waste Management Permit Program and Related Hazardous Waste Management, Standards Applicable to Generators of Hazardous Waste (329 IAC 3.1-7) [Lists those standards applicable to generators of hazardous waste, including manifesting].

(65)Solid Waste Management Board (Title 329), Article 3.1 - Hazardous Waste Management Permit Program and Related Hazardous Waste Management, Standards Applicable to Transporters of Hazardous Waste (329 IAC 3.1-8) [Adopts standards of 40 CFR 263, with State additions and exceptions].

(66)Solid Waste Management Board (Title 329), Article 3.1 - Hazardous Waste Management Permit Program and Related Hazardous Waste Management, Final Permit Standards for Owners and Operators of Hazardous Waste Treatment, Storage and disposal Facilities (329 IAC 3.1-9) [Adopts standards of 40 CFR 264, with State additions and exceptions for final permits and tank systems].

(67)Solid Waste Management Board (Title 329), Article 3.1 - Hazardous Waste Management Permit Program and Related Hazardous Waste Management, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (329 IAC 3.1-10) [Adopts standards of 40 CFR 265, with State additions and exceptions].

(68)Solid Waste Management Board (Title 329), Article 3.1 - Hazardous Waste Management Permit Program and Related Hazardous Waste Management, Land Disposal Restrictions (329 IAC 3.1-12) [Sets standards for land disposal restrictions and the adoption of federal land disposal restrictions].

(69)Solid Waste Management Board (Title 329), Article 3.1 - Hazardous Waste Management Permit Program and Related Hazardous Waste Management, Financial Requirements for Owner and Operators of Interim Status Hazardous Waste Treatment, Storage, and Disposal Facilities (329-IAC 3.1-14) [Requires a cost estimate and financial assurance for closure and post-closure care of interim status facilities; outlines approach options such as a closure trust fund for establishing financial assurance for closure and post-closure care of a facility; provides wording for trust agreement].

(70)Solid Waste Management Board (Title 329) Article 4.1 - PCB Waste Management, Disposal of PCB Wastes (329 IAC 4-1) [Incorporates and contains provisions in addition to 40 CFR 761].

(71)Solid Waste Management Board (Title 329), Article 9 - Underground Storage Tanks, Corrective Action (329 IAC 9-5) [Sets standards for release response, and corrective action, including abatement measures, characterization, and free product removal].

(72)Solid Waste Management Board (Title 329), Article 9 - Underground Storage Tanks, Closure (329 IAC 9-6) [Sets standards for closing or change-in-service for USTs].

(73)Solid Waste Management Board (Title 329), Article 10- Solid Waste Management, Industrial Onsite Activities Needing Permits (329 IAC 2-5) [Describes the applicability and application requirements for permits].

(74)Water Pollution Control Board (Title 327), Article 15 - Storm Water Run-off Associated with Construction Activity (327 IAC 15-5) [Sets requirements for managing point source discharges (stormwater) during construction activities, including sediment and erosion control].

(75)Water Pollution Control Board (Title 327) Article 3 - Wastewater Treatment Facilities, Construction and Permit Requirements (327 IAC 3-2) [Sets criteria for wastewater treatment facilities and issuance of permits and requirements for construction and permits].

(76)Water pollution Control Board (Title 327) Article 5 - Industrial Wastewater Programs (NPDES), (327 IAC 5-3) [Sets procedures for the issuance of NPDES permits].

Other Requirements to be Considered (TBCs)

Federal

(77)Geological Survey Professional Paper 579-0, Elemental Composition of Surficial Materials in the Conterminous United States, 1971. Schacklette, H.T., J.C. Hamilton, J.G. Boerrgen and J.M. Bowles [Provides background levels of metal in soils for the United States].

(78)National Oceanic and Atmospheric Administration Technical Memorandum NOSOMA52 1990. The Potential for Biological Effects of Sediment - sorbed Contaminants Tested in the National States and Trends Program; Long E.R. and L.G. Morgan. [Provides sediment quality guidelines]

(79)National Oceanic and Atmospheric Administration Quick Reference Cards, 1994, Buchman, M., HAZMAT Report 94-8. [Provides sediment quality guidelines].

(80)Ontario Ministry of the Environment Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario, 1993, Persaud D., Joaqumasi, A. Hayton. [Provides sediment quality guidelines]

(81)Occupational Safety and Health Administration Standards (29 CFR 1910; 1910.1000), Subpart Z, Toxic and Hazardous Substances [Sets worker exposure limits to toxic and hazardous substances and prescribes the methods for determination of concentrations].

(82)Occupational Safety and Health Administration Standards (29 CFR 1910; 1910.95), Subpart G, Occupational Noise Exposure. [Sets limits of worker exposure to noise during the performance of their duties].

(83)Occupational Safety and Health Administration Standards (29 CFR 1910; 1910.120), Hazardous Waste Operations and Emergency Response [Sets the standards for workers conducting hazardous waste operations and emergency response].

(84)Occupational Safety and Health Administration Standards (29 CFR Part 1926) [Specifies the type of safety equipment and procedures to be followed during site remediation].

(85)Occupational Safety and Health Administration Standards Record keeping, Reporting and Related Regulations (29 CFR 1904) [Establishes Record keeping and reporting requirements for an employer under OSHA].

(86)OSWER Directive 9355.4-01-Guidance on Remedial Actions for Superfund Sites with PCB Contamination [Sets soil PCB clean-up levels and management controls for PCB concentrations at Superfund sites].

(87)OSWER Directive 9355.4-12 - Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Sites and RCRA Corrective Action Facilities. [Sets soil lead clean-up levels for Superfund sites].

(88)Safe Drinking Water Act (42 USC 300f, et seq.), Subpart F, Maximum Containment Level Goals (40 CFR 141.50 - 141. 51) [Establishes unenforceable clean-up goals for drinking water based on technology and health risk].

(89)Threshold Limit Values [Consensus standards for controlling air quality in work place environments; used to assess site inhalation risks for soil removal operations].

(90)U.S. Environmental Protection Agency, RCRA Guidance Manual for Subpart G Closure and Post-Closure Standards and Subpart H Cost Estimating Requirements, January 1987. [Provides guidance on closure and post-closure standards and cost estimating requirements for hazardous waste management units].

(91)U.S. Environmental Protection Agency, Closure of Hazardous Waste Surface Impoundments, September, 1980. [Provides guidance for closure of surface impoundments].

(92)U.S. Environmental Protection Agency, Disposal of Polychlorinated Biphenyls, Proposed Rule, December 6, 1994. [Provides for disposal of non-liquid PCB remediation waste generated

by clean-up process of their existing concentration; provides for a risk-based remediation option for PCB remediation waste].

(93)U.S. Environmental Protection Agency, Soil Screening Guidance, December 1994 [Provides generic risk-based soil screening values for Superfund sites].

(94)U.S. Environmental Protection Agency Region III, Risk - Based Concentration Table, Smith R., 1995. [Provides risk-based screening values for groundwater and soil concentrations].

(95)U.S. Environmental Protection Agency, Integrated Risk Information System (IRIS), 1995 - 1996. [Provides reference doses and cancer potency slopes for calculating the hazard index or incremental cancer risk for specific site contaminants].

(96)U.S. Environmental Protection Agency, Interim Policy for Planning and Implementing CERCLA Off-Site Response Actions, November 5, 1995. [Specifies appropriate method of off-site treatment on disposed of waste from a Superfund site].

(97)U.S. Environmental Protection Agency, Sediment Quality Criteria for the Protection of Benthic Organisms: Dieldrin, Endrin, Fluoranthene and Phenanthrene, 1993. [Provides sediment quality criteria].

(98)U.S. Environmental Protection Agency, Summary Quality Criteria for Water, Office of Science and Technology, 1992. [Provides ambient water quality criteria].

(99)U.S. Environmental Protection Agency, Quality Criteria for Water, Office of Water Regulation and Standards, U.S. EPA 440/5-86-001, 1986. [Provides ambient water quality criteria].

(100)U.S. Environmental Protection Agency, Ambient Water Quality Criteria for Polychlorinated Biphenyls, U.S. EPA 440/5-80-068, 1980. [Provides ambient water quality criteria for PCBs].

(101)U.S. Environmental Protection Agency, Risk Assessment Guidance for Superfund: Environmental Evaluation Manual, Volume II, Final Report, EPA/540/1-89/002, 1989. [Provides guidance for conducting ecological risk assessments].

(102)U.S. Environmental Protection Agency, Risk Assessment Guidance for Superfund. Volume I. Human Health Evaluation Manual Supplemental Guidance. Standard Default Exposure Factors, Interim Final, March, 1991. OSWER Directive #9285.6-03, 1991. [Provides exposure factors for estimating hazard or risk in human health risk assessments].

(103)U.S. Environmental Protection Agency, Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual, Part A, December, 1989. U.S. EPA 540/1-89/002. Office of Emergency and Remedial Response. [Provides guidance on preparing a baseline human health risk assessment using the four steps, data evaluation, exposure assessment, toxicity assessment, risk characterization].

The following is a list of TBCs for obtaining a technical impracticability (TI) waiver for groundwater at Superfund sites:

(104)OSWER Directive 9200.4-14, Consistent Implementation of the Fiscal Year 1993 Guidance on Technical Impracticability of Groundwater Restoration at Superfund sites. [Addresses implementation of the OSWER guidance for evaluating TI waivers].

(105)OSWER Memorandum July 31, 1995, Superfund Groundwater RODs: Implementations change their Fiscal Year, [Discusses appropriateness of TI waivers for groundwater contaminated with DNAPLS].

(106)OSWER Directive 9234.2-25, Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration - Interim Final. [Provides guidance for evaluating TI waivers].

The following is a list of TBCs related to CAMUs at Superfund sites. It is noted that a number of these TBCs are under consideration and not yet promulgated.

(107)U.S. Environmental Protection Agency, Environmental News, January 15, 1993 [States that CAMU is applicable for contiguous areas within a facility as designated by the Regional Administrator for the purpose of implementing corrective action requirements of this Subpart (40 CFR 260.10), which is contaminated by hazardous waste (including hazardous constituents), and which may contain discrete, engineered land-based sub-parts].

(108)U.S. Environmental Protection Agency, Requirements for Management of Hazardous Contaminated Media, Proposed Rule, April 29, 1996. [Proposes new regulations for contaminated material that are managed during government-overseen RAs; proposes to withdraw the regulations for CAMUs].

State

(109)Indiana Department of Environmental Management, Risk Integrated System of Closure (RISC) Technical Resource Guidance Document, February 15, 2001. [Provides risk-based clean-up concentrations].

(110)Indiana Department of National Resources, Indiana Stormwater Quality Manual. Establishes design criteria, standards and specifications for erosion control measures required within a construction site].

(111)Natural Resources Conservation Service (NRCS), Field Office Technical Guide [Establishes design criteria, standards and specifications for erosion control measures required within a construction site].

(112)New York Department of Environmental Conservation (NYSDEC), Technical Guidance for Screening Contaminated Sediments, January 1999 reprint, NYSDEC Divisions of Fish and Wildlife and Marine Resources. [Provides sediment quality guidelines, update and reprint from 1993 edition, contains 1998 and 1999 change sheets].

APPENDIX B
Comments Received from Support Agencies and/or the Community

(This page reserved)

APPENDIX C
Data Evaluation Summary Report
2006/2007 Pre-Construction Sediment Investigation
Continental Steel Superfund Site

Data Evaluation Summary Report 2006/2007 Pre-construction Sediment Investigation Continental Steel Superfund Site USEPA WA No. 001-RARA-05BW

TO: Nabil Fayoumi/U.S. Environmental Protection Agency

FROM: Amie Obermeier/CH2M HILL

CC: Dan Plomb/CH2M HILL

Dong Son Pham/CH2M HILL

DATE: May 8, 2007

Introduction

This memorandum describes the procedures and results of the field investigation associated with the Remedial Action (RA) activities at the Continental Steel Superfund Site in Kokomo, Indiana. The field investigation was conducted from November 27, 2006, through April 18, 2007, in accordance with the following U.S. Environmental Protection Agency (USEPA)-approved site-specific plans prepared by CH2M HILL:

- Field Sampling Plan (CH2M HILL, November 2006)
- Quality Assurance Project Plan (CH2M HILL, November 2006)
- Health and Safety Plan (CH2M HILL, October 2006)

A previous investigation took place during the fall of 2001 to determine the volume of sediment requiring removal. Since the investigation in 2001, a 100-year flood occurred leading the USEPA to recommend another investigation of sediment volumes marked for removal. During this investigation samples were to be collected in the same manner as the previous investigation. Specifically, the objectives of the 2006/2007 pre-construction sediment investigation involved collecting data to:

- Determine the impact of a 100-year flood since the previous investigation.
- Better delineate the extent of the contaminated sediment and associated creek bank soil before the start of dredging operations.
- Delineate the horizontal and vertical extent of polychlorinated biphenyls (PCBs), arsenic, beryllium, and polynuclear aromatic hydrocarbons (PAHs)-containing material within Kokomo and Wildcat Creeks from which dredge volumes can be estimated.
- Determine the extent of lead contamination within the soil along the bank of Kokomo Creek, located directly behind the Continental Steel Main Plant property.

This memorandum includes the following:

- Description of the field investigation activities, including a summary of sampling locations, sampling methods, and deviations from the site-specific project plans.
- Tabulated summary of sample locations, field measurements, and analytical results.

Field Activities

The preconstruction sediment investigation was conducted from November 27, 2006, through March 15, 2007. The sampling team also returned during the week of April 16, 2007, to complete four additional samples that were recommended to better delineate an area within Wildcat Creek. The preconstruction sediment investigation consisted of sampling transects in Kokomo and Wildcat Creeks spaced at approximately 150-foot intervals. Sediment core samples were collected at four locations within each transect. These samples were analyzed by two separate labs: the USEPA onsite mobile laboratory analyzed the samples for PCBs and PAHs, while the Contract Laboratory Program (CLP) offsite laboratory analyzed the samples for arsenic and beryllium. During the time that the USEPA mobile laboratory operated onsite, the CLP offsite laboratory also received 10 percent of the samples collected for PCBs and PAHs to demonstrate the accuracy and precision of the USEPA onsite laboratory. In mid-January 2007, staff from the onsite USEPA mobile laboratory returned to their Central Regional Laboratory (CRL) office located in Chicago, Illinois, and began analysis of PCB and PAH samples at their Chicago office. After the USEPA onsite laboratory moved to the CRL office, the analysis for 10 percent of the PCB and PAH samples by the CLP offsite laboratory was discontinued.

A limited number of soil samples were also collected along a 400-foot stretch of riverbank along Kokomo Creek, located directly behind the Continental Steel Main Plant property. These samples were analyzed for lead by a CLP offsite laboratory.

The preliminary PCB and PAH data was received and reviewed by CH2M HILL. Based on this preliminary analysis, additional sampling locations were identified and sampled in order to better delineate certain areas of contamination within the creeks.

Site activities, field measurements, sediment sampling procedures, and deviations from the approved site-specific plans are discussed in the following sections. A chronological summary of field activities is provided in Table 1.

TABLE 1
Chronological Summary of Field Activities

Dates	Field Activities
November 20, 2006	USEPA mobile laboratory arrives onsite
December 1, 2006	CH2M HILL job trailer arrives onsite, electricity is established
December 15, 2006–March 15, 2007, April 17–18, 2007	Pre-construction sediment sampling
December 15, 2006–January 9, 2006	USEPA mobile laboratory analyzes samples for PCBs and PAHs
January 10, 2006–March 15, 2007, Week of April 16, 2007	PCB and PAH samples sent to CRL in Chicago for analysis

TABLE 1
Chronological Summary of Field Activities

Dates	Field Activities
December 15, 2006–March 15, 2007, Week of April, 16, 2007	Samples for arsenic, beryllium, and lead are shipped to CLP laboratories for analysis
February 5, 2007–March 1, 2007	Kokomo and Wildcat Creeks frozen, no sampling

Positioning and Field Measurements

A hand-held GPS unit was used to locate predetermined sample locations within the creeks. Sample locations were located along transects that were positioned approximately every 150 feet along Kokomo and Wildcat Creeks. Each transect contained four sample points; two points were located on each side of the creek, while the other two points were located between the side locations. The GPS locations for these points were provided to the sampling team prior to sampling. Once the boat was positioned over the predetermined sample location, the boat was anchored into place and an actual GPS location was recorded in the field notebook.

Prior to core samples being collected at each sample location, the water depth and sediment thickness was measured and recorded. The water depths were determined by placing a metal probing rod with measurements marked along the side of the rod into the water until the creek bottom was located. The sediment depths were determined by pushing the metal rod into the creek bottom until refusal. In addition, field personnel recorded observations regarding the type of creek bottom at the sample locations. A summary of field measurements and lateral coordinates is provided in Appendix A.

Sampling Procedures

Upon completion of the water and sediment depth measurements, sediment coring was initiated by using either a hand auger or 8-foot Lexan™ tubes. The auger and tubes were used interchangeably depending on the type of sediments at the bottom of the creek. Sediment samples were collected by penetrating the hand auger or core tube vertically into the bottom sediments until refusal, which in most cases was due to bedrock. The sediment retrieved using the hand auger or core tube was placed into an aluminum pan and homogenized with a stainless steel spoon. Sample jars for the analysis required were filled, appropriately labeled, and stored in sample coolers on board the boat until the end of the workday. At the end of the workday, the samples were taken to a field trailer, placed in coolers with ice and prepared for shipment to the appropriate laboratories.

Sample Processing

Once samples were returned to the field trailer at the end of the work day, they were processed following the Forms 2 Lite chain-of-custody requirements for shipment to the appropriate laboratories. Samples for PCB and PAH analyses were submitted to the USEPA onsite mobile laboratory. In mid-January, staff from the onsite USEPA mobile laboratory returned to their CRL office located in Chicago, Illinois and began analysis of PCB and PAH samples at their Chicago office. Samples for arsenic, beryllium, and lead were analyzed by a

USEPA CLP laboratory. The CLP laboratory also analyzed 10 percent of the PCB and PAH samples while the USEPA laboratory operated onsite. Once the USEPA laboratory staff returned to the CRL in Chicago, analysis of 10 percent of the PCB and PAH samples by the CLP was discontinued.

After completion of the chain-of-custody and the USEPA tags using Forms 2 Lite, the samples were tagged and packaged in coolers with packing material to prevent the jars from breaking. The samples were then surrounded by Ziploc® bags of ice and a temperature blank was placed inside the cooler. The chain-of-custody was attached to the inside lid of the cooler prior to sealing the cooler.

Coolers were wrapped with strapping and packing tape at each end to ensure they were closed securely. Address labels and air bills were attached to the coolers as well. After the coolers were sealed and labeled, a field team member delivered the coolers to FedEx for shipment. A summary of the samples collected and the analyses is provided in Table 2.

TABLE 2
Summary of Collected Samples and Analyses

Description	USEPA Onsite Mobile Laboratory/CRL	CLP Laboratory
PCB analyses	365	11
PAH analyses	357	11
Arsenic analyses	NA	357
Beryllium analyses	NA	357
Lead analyses	NA	9
Total MS/MSD samples	14	14
Total duplicate samples	40	40

MS/MSD = matrix spike/matrix spike duplicate

Deviations from Proposed Sampling Procedures. The only major deviation from the proposed field investigation activities was the sampling of riverbank soils for analysis of lead. Sampling along the Kokomo Creek riverbank for lead levels was originally described in the Continental Steel Main Plant site-specific plans as an activity that would be performed during the creeks investigation, rather than the Kokomo and Wildcat Creek site-specific plans.

IDEM completed dry excavation to remove lead-contaminated soils from the Continental Steel Main Plant Property, up to the creek bank. After dry excavation was complete, a CH2M HILL representative met with IDEM to discuss the location along the bank of possible lead contamination behind the Continental Steel Main Plant. Based on these discussions, a 400-foot bank section along Kokomo Creek was sampled to determine the potential for any remaining lead contamination.

Field Observations

The following items were observed while conducting work in Kokomo and Wildcat Creeks:

- Throughout Wildcat Creek, sediment depths were more substantial on the sides of the creek. Many areas of no recovery due to rock were found in the middle of the creek.
- Creek levels fluctuated significantly and regularly.
- Due to cold temperatures, Kokomo and Wildcat Creeks froze completely in early February 2007 and did not thaw until early March 2007.

Analytical Results

Over the course of the investigation, 436 sample points were attempted. There were no recoveries for 71 of these locations. Explanations for no recoveries are provided in Appendix A.

A total of 397 sediment samples, including field duplicate samples, were collected from Kokomo and Wildcat Creeks and analyzed by the CLP laboratories for arsenic and beryllium. CLP laboratories also analyzed the nine lead samples that were collected along the bank in Kokomo Creek. The USEPA onsite mobile laboratory received 397 PAH samples and 405 PCB samples for analysis. During the period when the USEPA mobile laboratory was operating onsite, the CLP laboratories also received 11 PCB and PAH samples to analyze for comparison of accuracy and precision with the onsite laboratory.

The sampling locations are identified on Figure 1. After sampling in Kokomo Creek, it was decided that additional poling would be completed to better determine the characteristics of the creek bottom. The additional poling locations are provided on Figure 2, while data collected during poling is provided in Appendix B. Analytical results are graphically depicted in Figures 3 through 11.

Dredge Area Delineation

The selected alternative for Wildcat and Kokomo Creeks consists of removing sediments with PCB concentrations that exceed 3 times the remedial goal (that is, 3 milligrams per kilogram [mg/kg]) and PAH concentrations greater than 5 times their respective remedial goals. Dredge areas were not determined using the arsenic, beryllium, or lead data. However, removal of sediment from dredge areas delineated using the PCB and PAH data will remove much of the sediment impacted by these metals.

Using the analytical data, dredge areas were delineated using a two-dimensional interpolation of PCBs and five PAH compounds of interest (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]fluoranthene, and ideno[1,2,3-cd]pyrene). Upon delineation of the dredge areas for each of the six individual analytes, the dredge areas were merged together to produce an overall dredge area. The delineated dredge area is depicted in Figure 12.

Figures

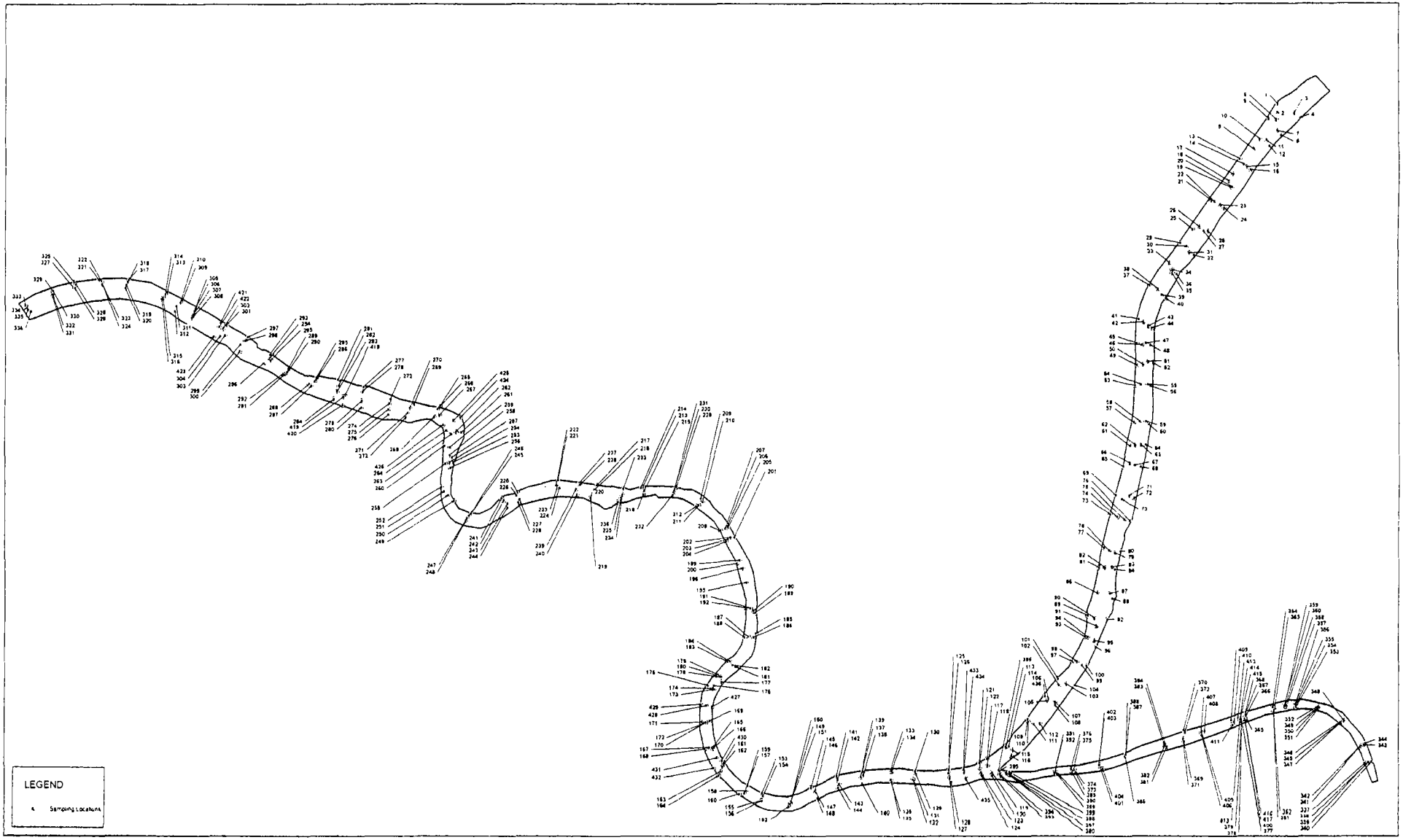


FIGURE 1
All Sampling Locations - Wildcat and Kokomo Creek
Continental Steel

CH2MHILL

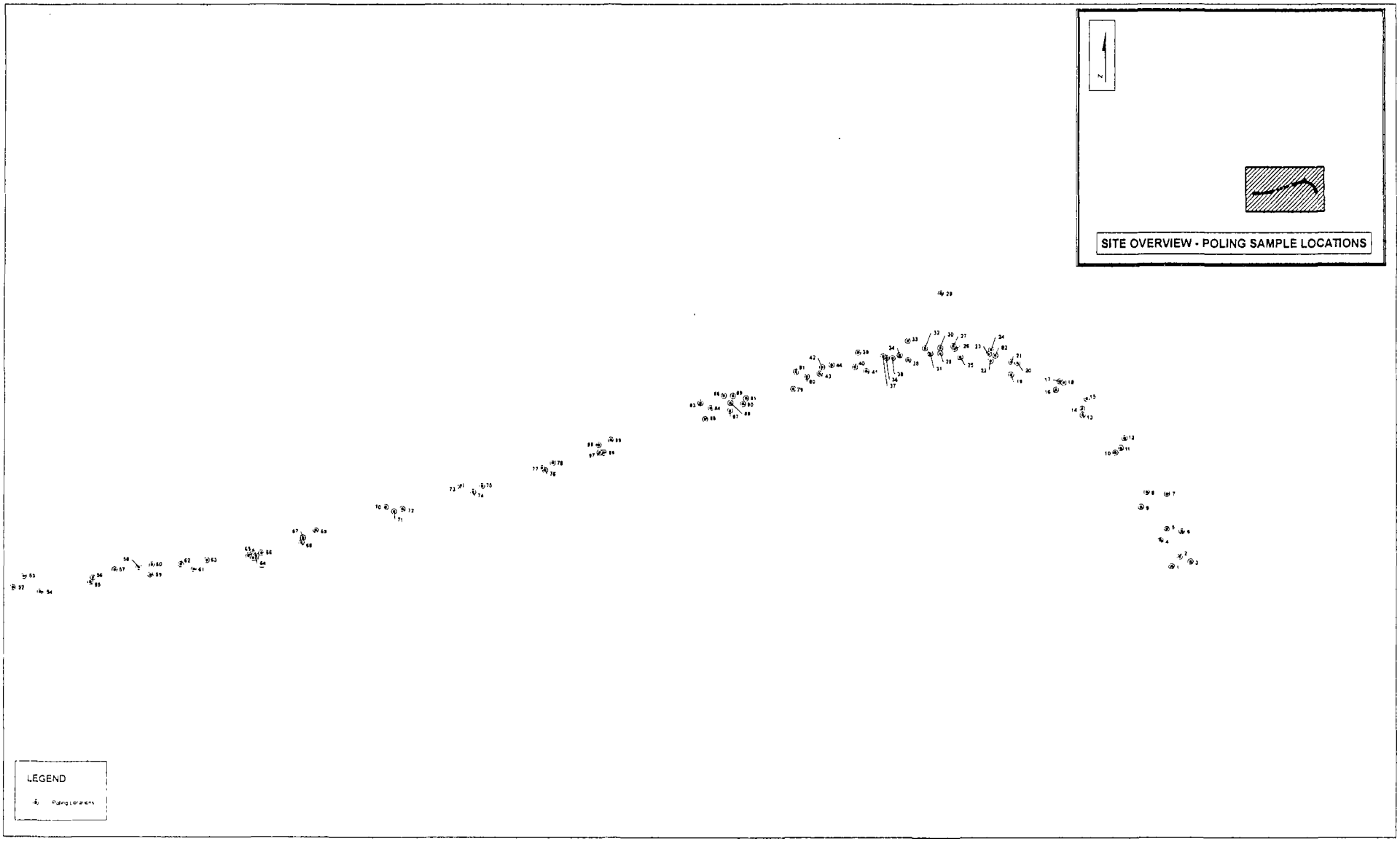
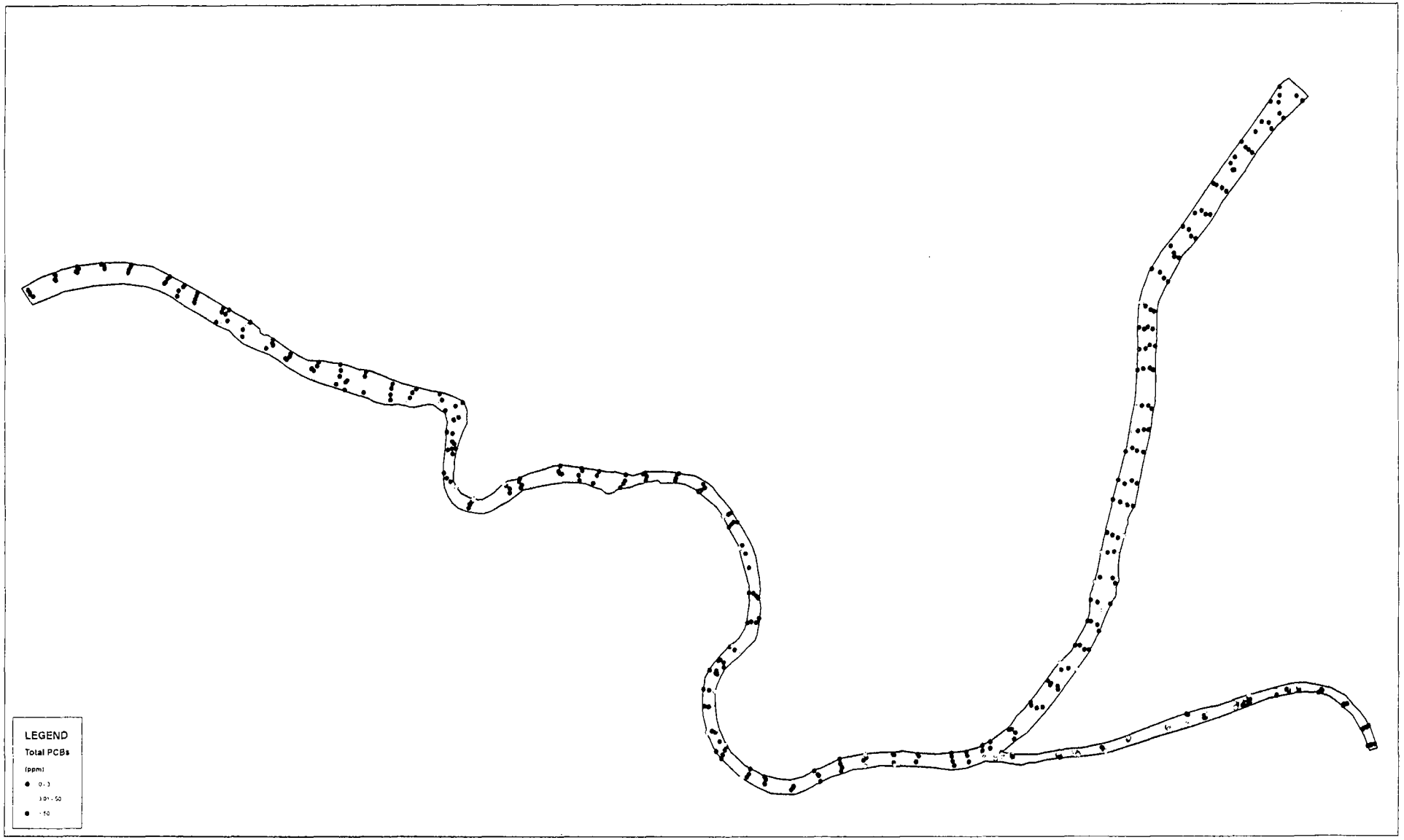


FIGURE 2
Poling Locations
Kokomo Creek
Continental Steel

CH2MHILL



0 240 480
Feet

FIGURE 3
Total PCB Sample Results for Dredge Area Analysis
Continental Steel

CH2MHILL

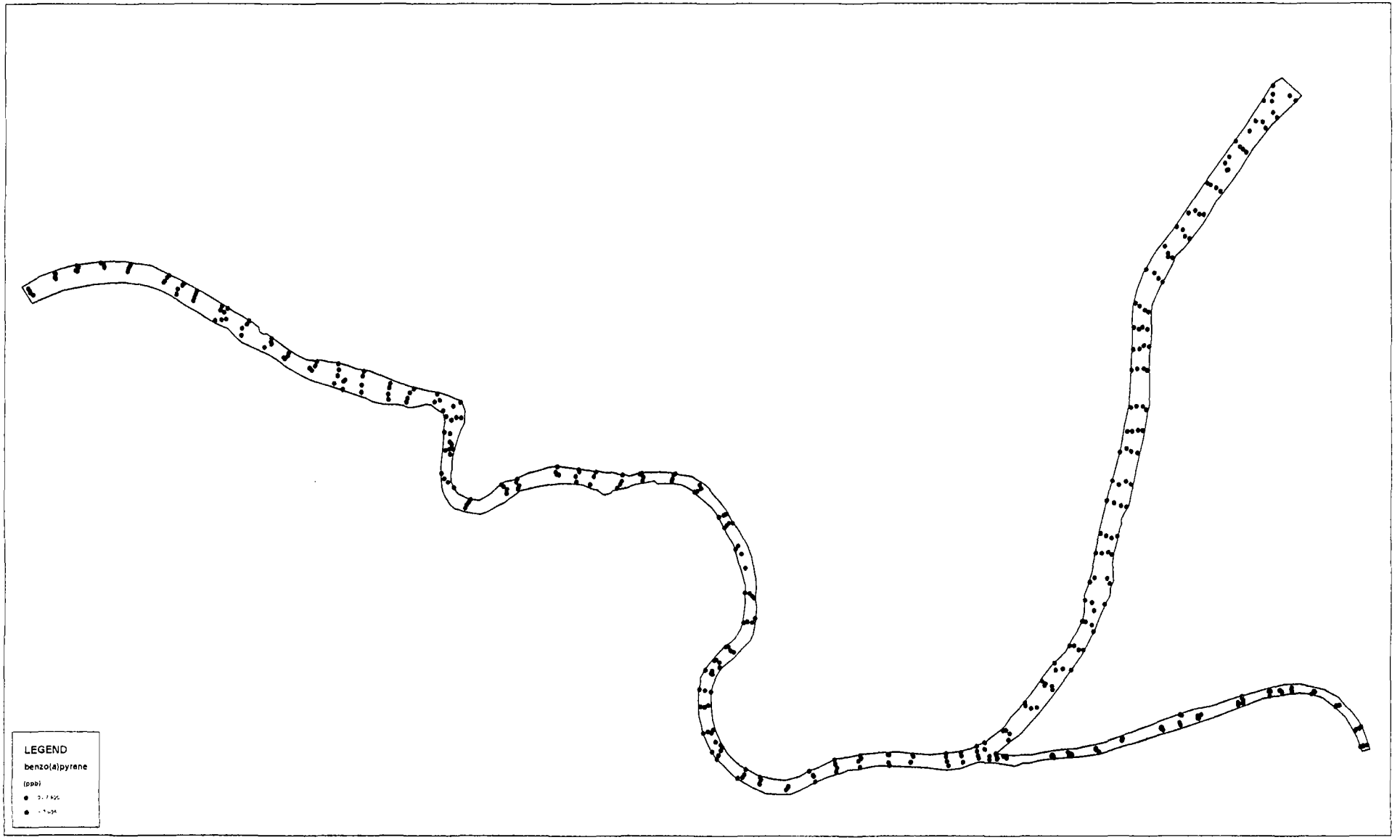


FIGURE 4
Benzo(a)pyrene Sample Results
for Dredge Area Analysis
Continental Steel

CH2MHILL

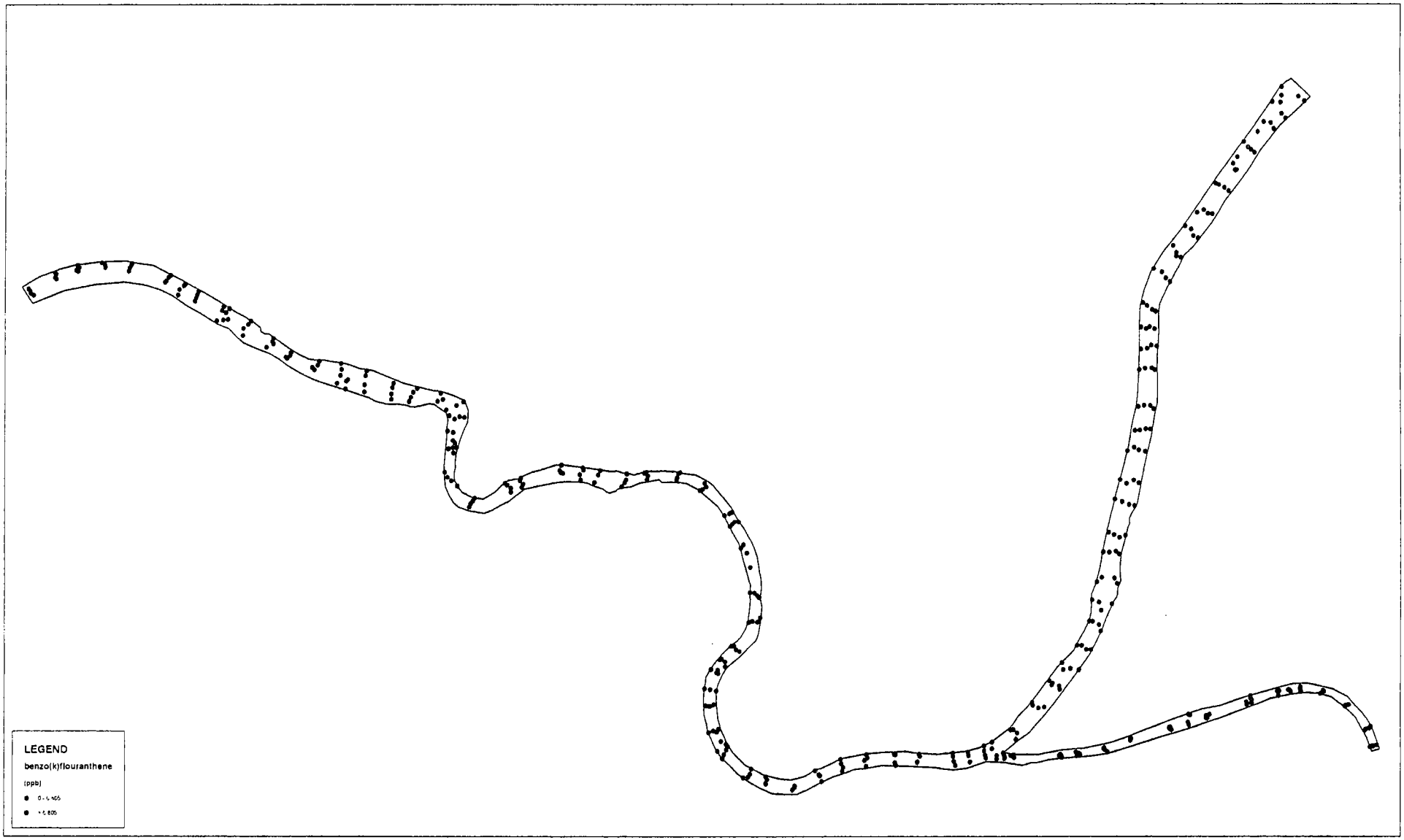


FIGURE 5
Benzo(k)flouranthene Sample Results
for Dredge Area Analysis
Continental Steel

CH2MHILL

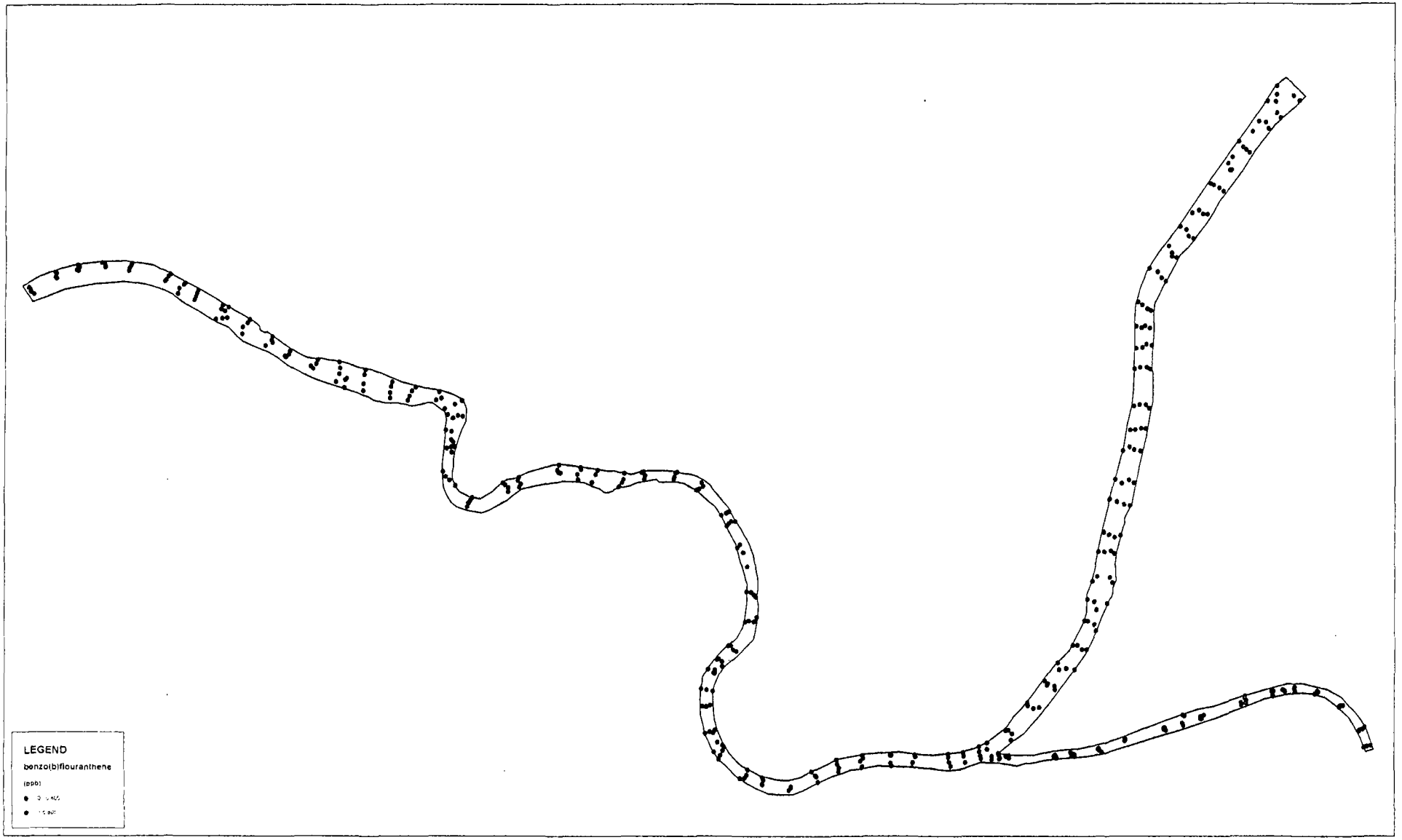


FIGURE 6
Benzo(b)flouranthene Sample Results
for Dredge Area Analysis
Continental Steel

CH2MHILL

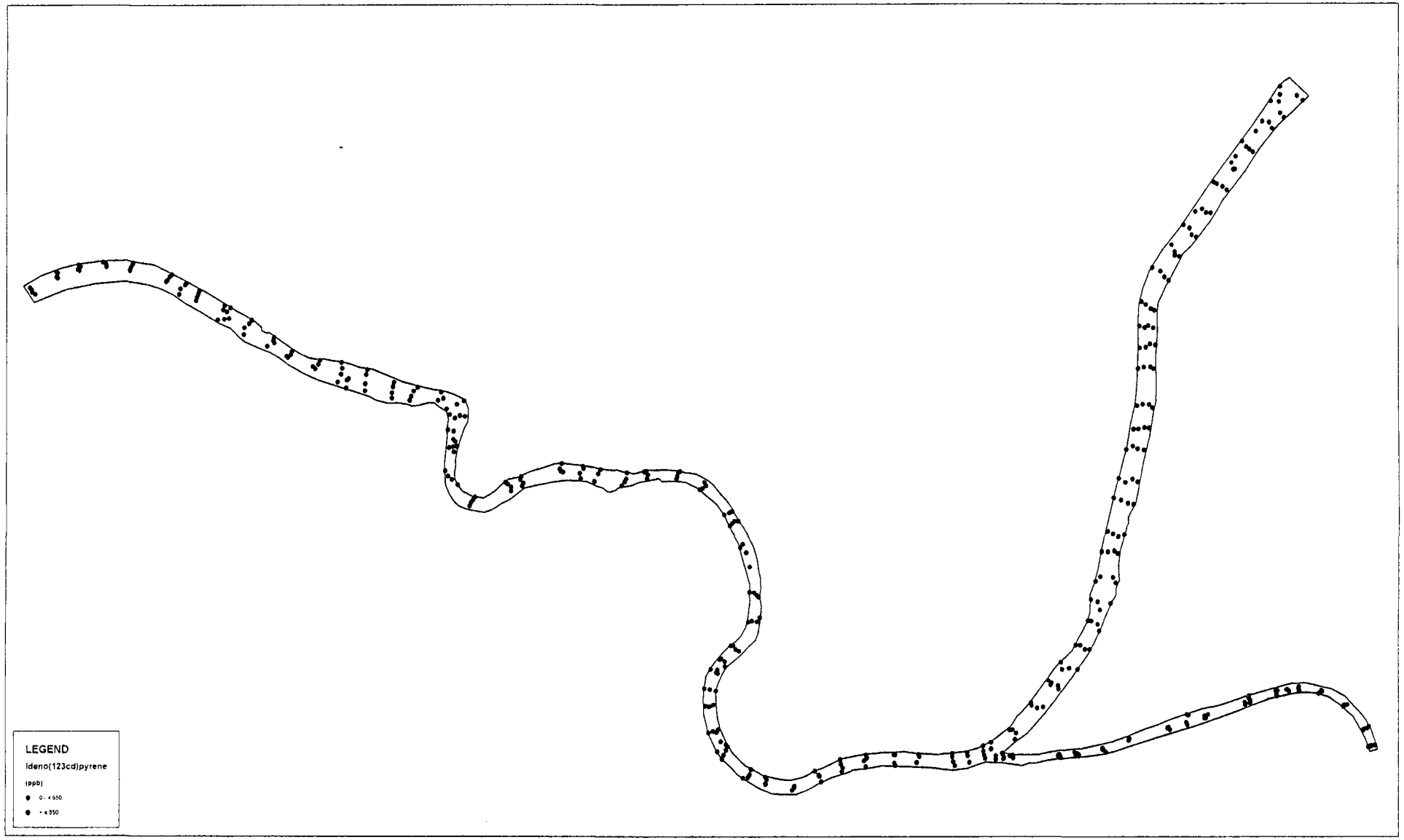


FIGURE 7
Ideno(123cd)pyrene Sample Results
for Dredge Area Analysis
Continental Steel

CH2MHILL

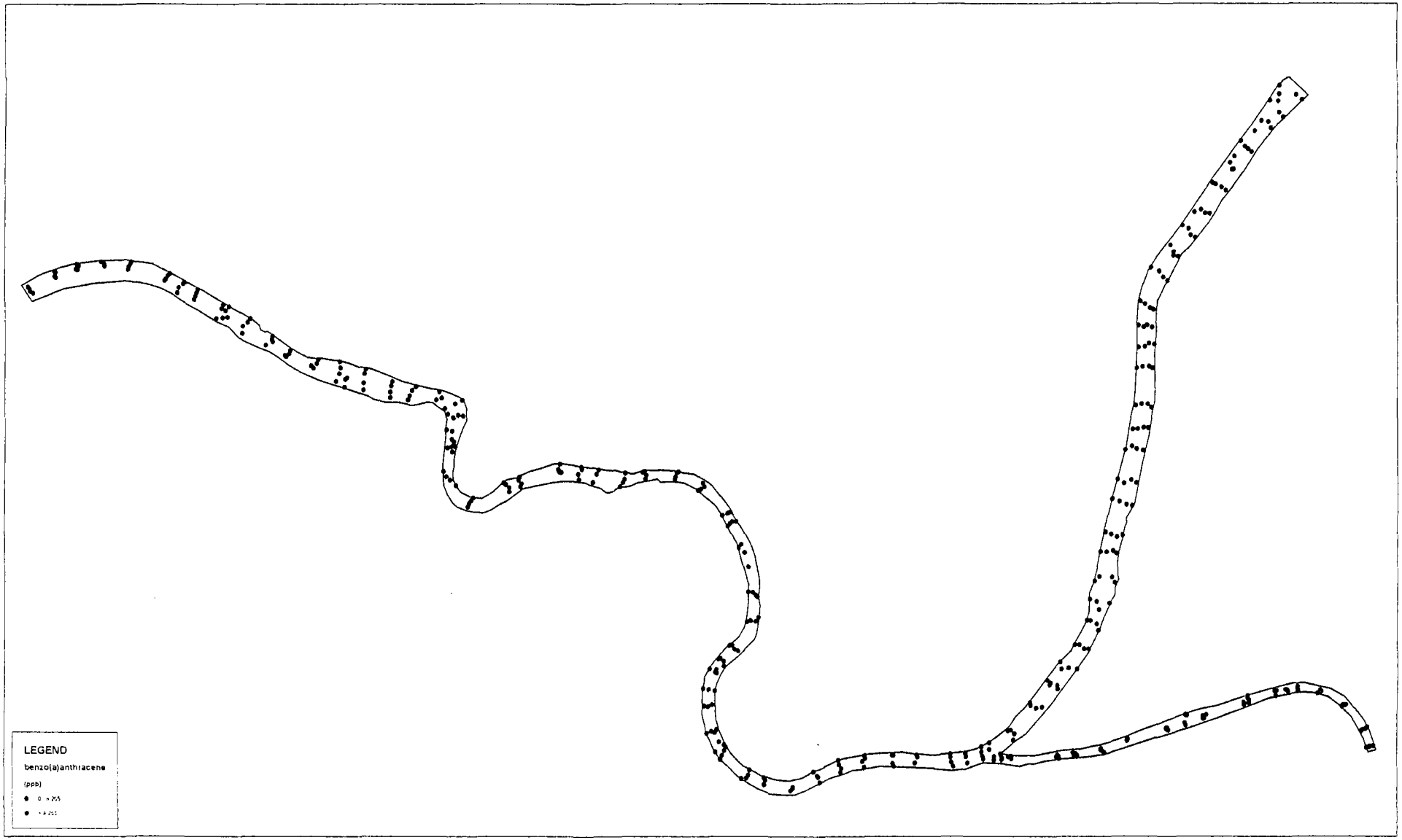


FIGURE 8
Benzo(a)anthracene Sample Results
for Dredge Area Analysis
Continental Steel

CH2MHILL

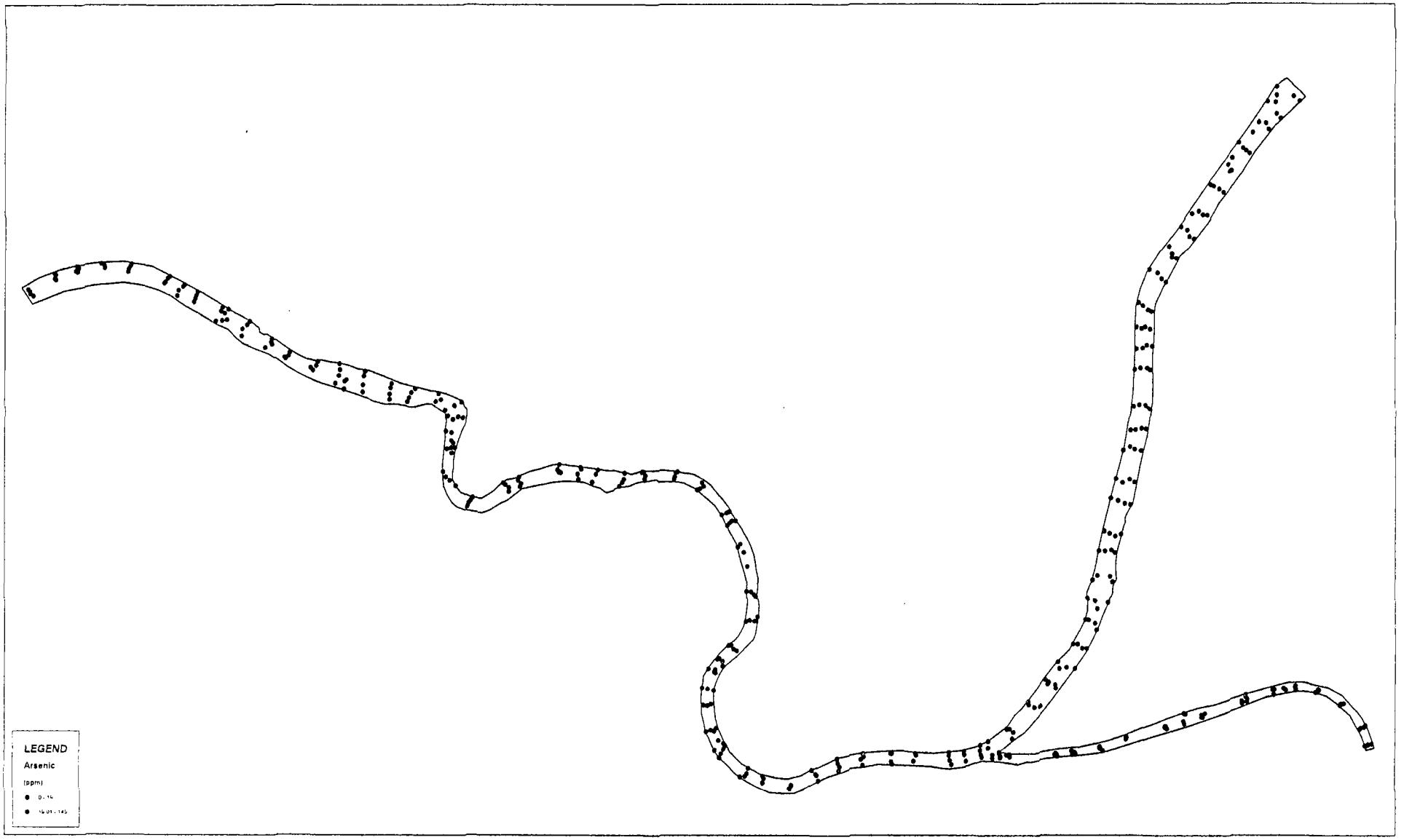


FIGURE 9
Arsenic Sample Results
for Dredge Area Analysis
Continental Steel

CH2MHILL

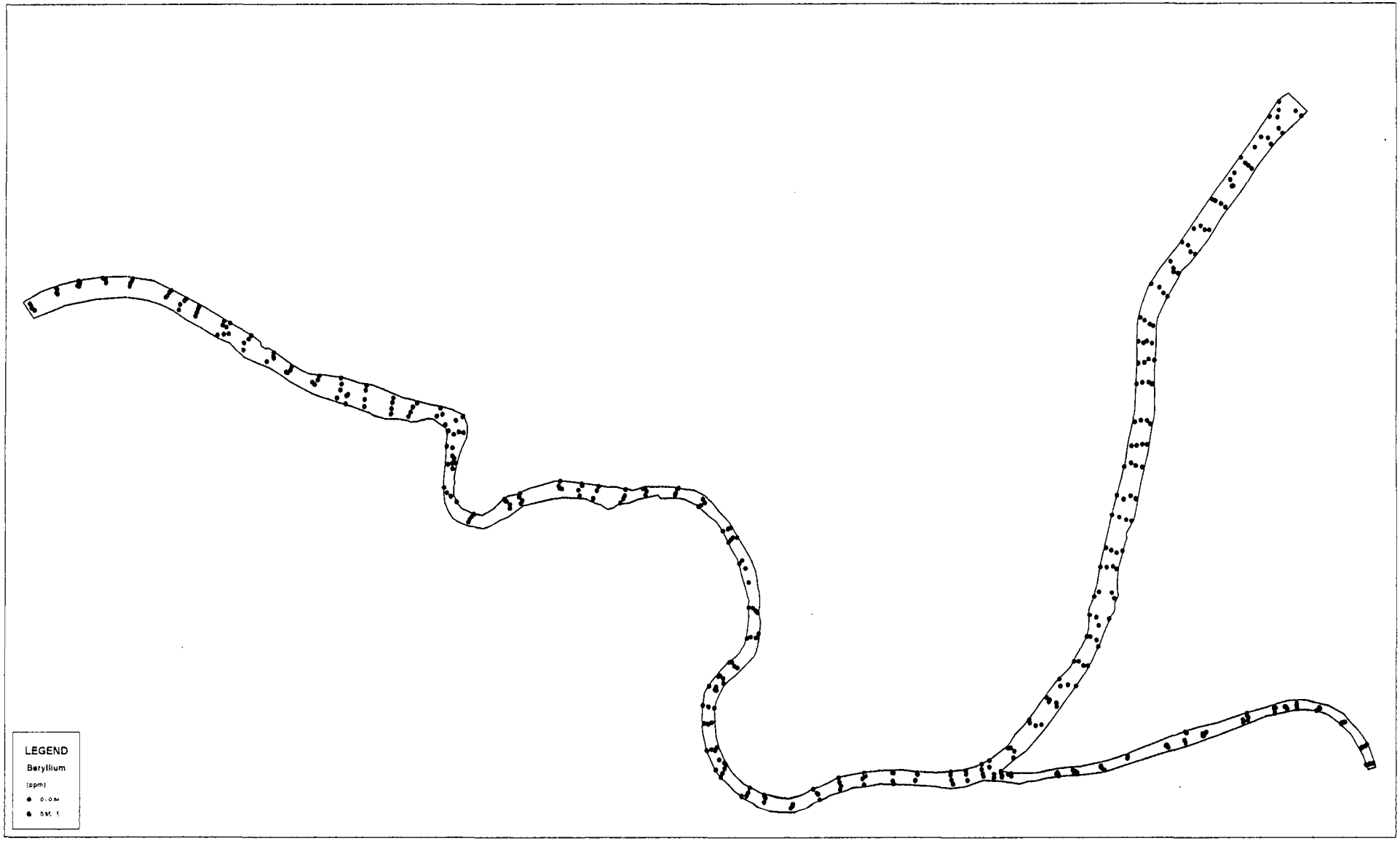


FIGURE 10
Beryllium Sample Results
for Dredge Area Analysis
Continental Steel

CH2MHILL

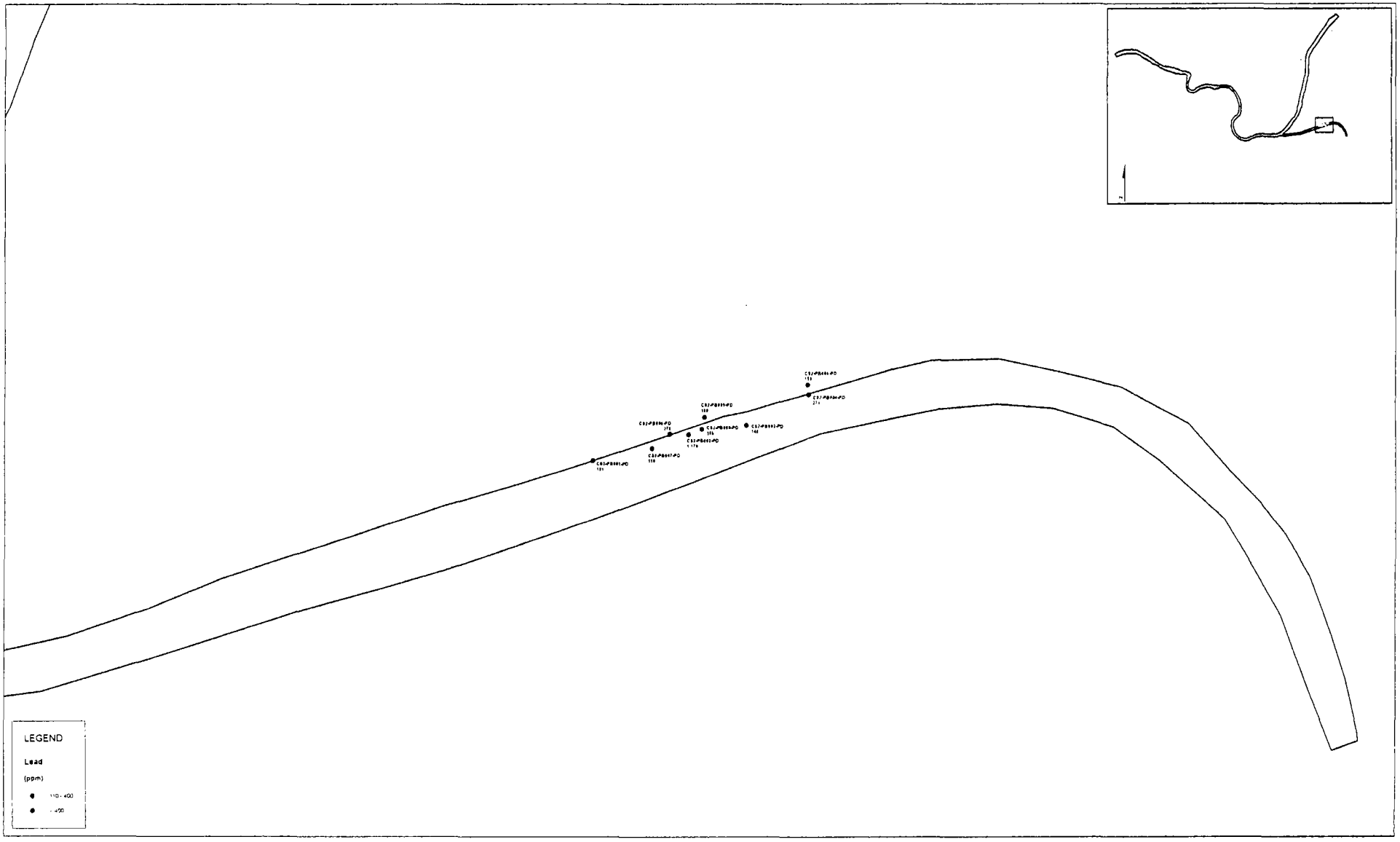


FIGURE 11
Lead Sample Results
for Dredge Area Analysis
Continental Steel

CH2MHILL

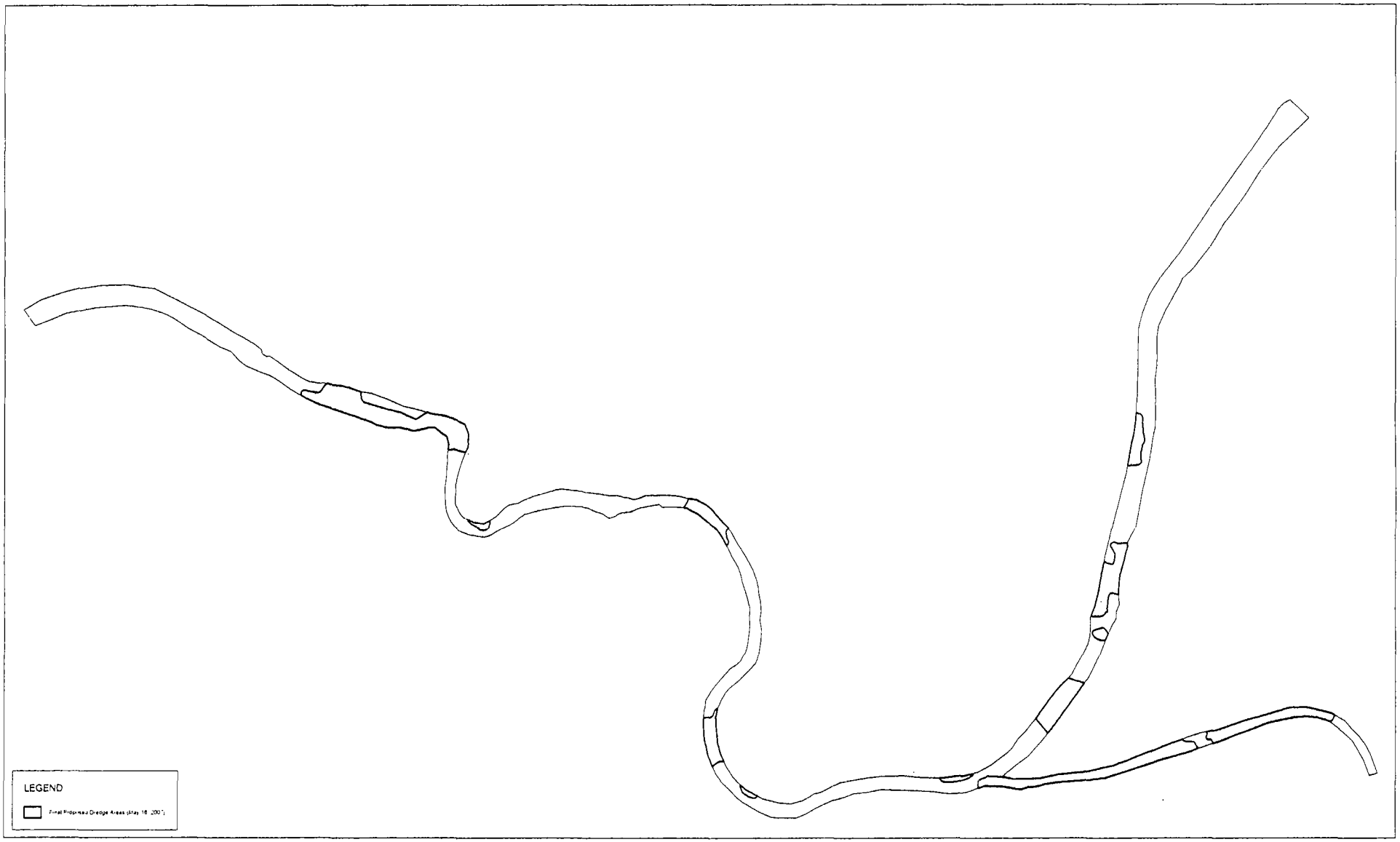


FIGURE 12
Final Proposed Dredge Areas
May 16, 2007
Continental Steel

CH2MHILL

Appendix A
Sampling Field Measurements

APPENDIX A

Sampling Field Measurements

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD001-PD	3/6/2007	1022	1.92	0.33	Yes	black sediment mixed with some sand and gravel
CS2-SD002-PD	3/6/2007	1045	3.42	0.33	Yes	black sediment mixed with sand and gravel
CS2-SD003-PD	3/6/2007	1057	3.08	0.00	No Recovery	bedrock
CS2-SD004-PD	3/6/2007	1110	3.58	0.58	Yes	black sediment with some sand and gravel
CS2-SD005-PD	3/6/2007	1145	2.25	1.08	Yes	dark sediment and sand
CS2-SD006-PD	3/6/2007	1132	2.50	0.42	Yes	brown sediment, sand and gravel
CS2-SD007-PD	3/6/2007	1122	2.67	0.25	Yes	course colored sand with gravel
CS2-SD008-PD	3/6/2007	1116	2.17	0.25	Yes	black sediment with some sand and gravel
CS2-SD009-PD	3/6/2007	1155	2.50	0.17	Yes	black sediment with some sand and gravel
CS2-SD010-PD	3/6/2007	1206	3.00	0.00	No Recovery	bedrock
CS2-SD011-PD	3/6/2007	1210	3.33	0.58	No Recovery	bedrock
CS2-SD012-PD	3/6/2007	1218	3.25	1.00	Yes	black sediment with some sand and gravel
CS2-SD013-PD	3/6/2007	1255	2.67	0.17	Yes	grayish black sediment with some gravel
CS2-SD014-PD	3/6/2007	1246	3.58	0.00	No Recovery	bedrock
CS2-SD015-PD	3/6/2007	1241	5.08	0.17	No Recovery	bedrock
CS2-SD016-PD	3/6/2007	1229	1.67	3.83	Yes	black sediment mixed with sand and gravel
CS2-SD017-PD	3/6/2007	1302	2.83	0.17	Yes	dark sediment with some sand
CS2-SD018-PD	3/6/2007	1310	5.83	0.00	No Recovery	bedrock

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD019-PD	3/6/2007	1315	6.00	0.25	Yes	colored course sand with black sediment
CS2-SD020-PD	3/6/2007	1323	2.75	3.08	Yes	dark sediment with some sand
CS2-SD021-PD	3/7/2006	0940	2.17	0.50	Yes	black silty sediment
CS2-SD022-PD	3/7/2006	0952	6.33	0.17	Yes	brown sand with some sediment and small gravel
CS2-SD023-PD	3/7/2006	1002	6.42	0.08	Yes	course colored sand with gravel
CS2-SD024-PD	3/7/2006	1010	3.08	1.00	Yes	black silty sediment with some gravel
CS2-SD025-PD	3/7/2006	1120	3.25	0.50	Yes	black silty sediment with some gravel
CS2-SD026-PD	3/7/2006	1105	6.08	0.17	No Recovery	bedrock
CS2-SD027-PD	3/7/2006	1058	5.83	0.17	Yes	course colored sand with gravel
CS2-SD028-PD	3/7/2006	1050	2.25	0.92	Yes	black silty sediment with some gravel
CS2-SD029-PD	3/7/2006	1127	1.83	2.83	Yes	black silty sediment with some gravel
CS2-SD030-PD	3/7/2006	1134	4.00	0.17	No Recovery	bedrock
CS2-SD031-PD	3/7/2006	1145	4.25	0.08	No Recovery	bedrock
CS2-SD032-PD	3/7/2006	1152	3.17	0.50	Yes	dark brownish black sediment with some gravel
CS2-SD033-PD	3/7/2006	1220	2.58	0.25	Yes	dark brownish black sediment with some gravel
CS2-SD034-PD	3/7/2006	1216	6.50	0.08	No Recovery	bedrock
CS2-SD035-PD	3/7/2006	1210	6.17	0.25	Yes	grayish sediment with gravel
CS2-SD036-PD	3/7/2006	1200	3.83	0.67	Yes	dark brownish black sediment with some gravel
CS2-SD037-PD	3/7/2006	1233	2.58	0.12	Yes	black sediment with some sand and gravel
CS2-SD038-PD	3/7/2006	1240	6.25	0.17	Yes	dark brown sediment, sand and gravel
CS2-SD039-PD	3/7/2006	1251	6.58	0.08	No Recovery	bedrock
CS2-SD040-PD	3/7/2006	1258	3.08	0.92	Yes	black sediment with some sand and gravel

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD041-PD	3/13/2007	0940	1.00	0.50	Yes	dark brownish black sediment
CS2-SD042-PD	3/13/2007	0952	3.67	0.00	No Recovery	bedrock
CS2-SD043-PD	3/13/2007	0956	4.67	0.04	No Recovery	bedrock
CS2-SD044-PD	3/13/2007	0959	1.58	3.33	Yes	dark brownish black sediment
CS2-SD045-PD	3/13/2007	1017	2.33	0.92	Yes	dark brownish black sediment
CS2-SD046-PD	3/13/2007	1014	3.25	0.00	No Recovery	bedrock
CS2-SD047-PD	3/13/2007	1012	3.00	0.00	No Recovery	bedrock
CS2-SD048-PD	3/13/2007	1006	3.42	0.50	Yes	dark brownish black sediment
CS2-SD049-PD	3/13/2007	1024	3.17	0.50	Yes	dark brownish black sediment
CS2-SD050-PD	3/13/2007	1031	3.83	0.02	No Recovery	bedrock
CS2-SD051-PD	3/13/2007	1034	3.08	0.00	No Recovery	bedrock
CS2-SD052-PD	3/13/2007	1037	1.67	1.92	Yes	dark brown sediment
CS2-SD053-PD	3/13/2007	1059	2.00	1.25	Yes	dark brown sediment
CS2-SD054-PD	3/13/2007	1057	4.17	0.00	No Recovery	bedrock
CS2-SD055-PD	3/13/2007	1054	4.33	0.00	No Recovery	bedrock
CS2-SD056-PD	3/13/2007	1045	3.17	0.67	Yes	dark brown sediment
CS2-SD057-PD	3/13/2007	1106	2.50	0.33	Yes	dark brown sediment
CS2-SD058-PD	3/13/2007	1112	5.83	0.00	No Recovery	bedrock
CS2-SD059-PD	3/13/2007	1114	4.67	0.33	Yes	course colored sand with some gravel
CS2-SD060-PD	3/13/2007	1129	3.08	0.67	Yes	dark brownish black sediment
CS2-SD061-PD	3/13/2007	1149	4.08	1.00	Yes	dark brownish black sediment
CS2-SD062-PD	3/13/2007	1146	6.00	0.08	No Recovery	bedrock

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD063-PD	3/13/2007	1142	6.00	0.08	No Recovery	bedrock
CS2-SD064-PD	3/13/2007	1136	2.25	0.92	Yes	dark brown sediment
CS2-SD065-PD	3/14/2007	0839	2.08	3.58	Yes	dark brownish black sediment
CS2-SD066-PD	3/14/2007	0847	5.25	2.17	Yes	dark brownish black sediment
CS2-SD067-PD	3/14/2007	0852	7.83	0.00	No Recovery	bedrock
CS2-SD068-PD	3/14/2007	0855	5.67	0.67	Yes	dark brownish black sediment
CS2-SD069-PD	3/14/2007	0934	3.00	3.25	Yes	dark brownish black sediment
CS2-SD070-PD	3/14/2007	0921	6.25	0.17	Yes	course colored sand with some gravel
CS2-SD071-PD	3/14/2007	0915	7.17	0.08	No Recovery	bedrock
CS2-SD072-PD	3/14/2007	0903	5.00	1.17	Yes	dark brownish black sediment
CS2-SD073-PD	3/14/2007	0941	1.83	2.25	Yes	dark brownish black sediment
CS2-SD074-PD	3/14/2007	0947	6.25	0.17	Yes	course colored sand with some gravel
CS2-SD075-PD	3/14/2007	0954	6.25	0.00	No Recovery	bedrock
CS2-SD076-PD	3/14/2007	0957	2.08	4.00	Yes	dark brownish black sediment
CS2-SD077-PD	3/14/2007	1015	3.00	1.25	Yes	dark brownish black sediment
CS2-SD078-PD	3/14/2007	1012	4.25	0.33	Yes	dark brownish black sediment
CS2-SD079-PD	3/14/2007	1007	4.92	0.50	Yes	dark brown sediment mixed with some sand and gravel
CS2-SD080-PD	3/14/2007	1003	1.92	1.25	Yes	dark brownish black sediment
CS2-SD081-PD	3/14/2007	1022	3.42	1.33	Yes	dark brownish black sediment
CS2-SD082-PD	3/14/2007	1027	5.67	0.04	No Recovery	bedrock
CS2-SD083-PD	3/14/2007	1029	5.83	0.00	No Recovery	bedrock
CS2-SD084-PD	3/14/2007	1033	2.83	2.33	Yes	dark brownish black sediment

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD085-PD	3/14/2007	1044	3.08	2.75	Yes	dark brownish black sediment
CS2-SD086-PD	3/14/2007	1049	6.83	0.00	No Recovery	bedrock
CS2-SD087-PD	3/14/2007	1052	6.25	0.04	Yes	dark brownish black sediment
CS2-SD088-PD	3/14/2007	1102	1.50	1.50	Yes	black sediment
CS2-SD089-PD	1/9/2007	1257	3.50	0.67	Yes	dark brown course sand and gravel with some sediment
CS2-SD090-PD	3/14/2007	1425	4.75	0.67	Yes	brown clay with gravel
CS2-SD091-PD	3/14/2007	1431	4.17	0.25	Yes	course colored sand with some gravel
CS2-SD092-PD	1/9/2007	1221	2.67	0.92	Yes	orangish brown silty sediment and sand
CS2-SD093-PD	1/9/2007	1139	3.67	1.00	Yes	black ashy silt with some sand
CS2-SD094-PD	1/9/2007	1150	5.42	0.67	Yes	brown course sand with some gravel
CS2-SD095-PD	1/9/2007	1200	3.92	0.67	Yes	brown course sand with some gravel
CS2-SD096-PD	1/9/2007	1210	3.00	1.00	Yes	black ashy silt with some sand and clay
CS2-SD097-PD	1/9/2007	1132	3.25	2.17	Yes	black ashy silt with some sand
CS2-SD098-PD	1/9/2007	1125	4.08	0.67	Yes	brown course sand with some gravel and clay
CS2-SD099-PD	1/9/2007	1118	4.17	0.50	Yes	orangish clay with gravel
CS2-SD100-PD	1/9/2007	1111	3.92	0.83	Yes	black ashy silt with some sand and clay
CS2-SD101-PD	1/9/2007	1025	3.25	1.25	Yes	black ashy silt with some sand, clay and gravel
CS2-SD102-PD	1/9/2007	1041	1.92	0.67	Yes	light brown clay with some sand and gravel
CS2-SD103-PD	1/9/2007	1051	3.08	1.08	Yes	light brown clay with some sand and gravel
CS2-SD104-PD	1/9/2007	1059	3.08	0.58	Yes	dark brown silt with some gravel and sand
CS2-SD105-PD	1/9/2007	1001	3.08	0.83	Yes	dark brown silt with some gravel and sand
CS2-SD106-PD	1/9/2007	0954	5.08	1.17	Yes	dark brown course sand with gravel

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD107-PD	1/9/2007	0947	4.17	0.58	Yes	light brown clay with some sand and gravel
CS2-SD108-PD	1/9/2007	0938	4.33	0.75	Yes	black ashy silt with some sand and clay
CS2-SD109-PD	1/9/2007	0908	4.25	2.00	Yes	black silt with some clay
CS2-SD110-PD	1/9/2007	0913	6.08	1.33	Yes	black silt with some clay and sand
CS2-SD111-PD	1/9/2007	0920	5.17	0.75	Yes	light brown silty sediment with some sand
CS2-SD112-PD	1/9/2007	0928	2.00	2.17	Yes	black silt with some clay and sand
CS2-SD113-PD	1/9/2007	0843	5.00	1.00	Yes	black silt with some clay and sand
CS2-SD114-PD	1/9/2007	0849	6.25	0.33	Yes	light brown clay with some sand and gravel
CS2-SD115-PD	1/9/2007	0853	4.67	0.75	Yes	light brown silt with some sand and gravel
CS2-SD116-PD	1/9/2007	0858	4.50	0.67	Yes	black silt with some clay and sand
CS2-SD117-PD	12/19/2006	0845	2.00	0.33	Yes	brownish fine sand mixed with some sediment and colored course sand
CS2-SD118-PD	12/19/2006	0851	4.67	0.25	Yes	brownish fine sand mixed with some sediment and colored course sand
CS2-SD119-PD	12/19/2006	0902	3.25	0.25	Yes	brownish fine sand mixed with some sediment and colored course sand
CS2-SD120-PD	12/19/2006	0905	3.42	0.33	Yes	light sand mixed with dark brown silty sediment and some leaves
CS2-SD121-PD	12/19/2006	0945	2.08	1.33	Yes	dark brown/black silty sediment mixed with some brown sand
CS2-SD122-PD	12/19/2006	0939	6.00	0.25	Yes	light gray clay mixed with some brown sand and small gravel
CS2-SD123-PD	12/19/2006	0925	6.00	0.21	Yes	brown sand with some light gray clay
CS2-SD124-PD	12/19/2006	0916	3.83	0.17	Yes	brown sand mixed with trace amounts of brown sediment
CS2-SD125-PD	12/19/2006	0953	2.17	0.83	Yes	brownish clay mixed with some orangish sand
CS2-SD126-PD	12/19/2006	1000	5.00	0.08	Yes	brown sand mixed with some colored pebbles and brown sediment

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD127-PD	12/19/2006	1013	5.00	0.17	Yes	brownish orange sand mixed with some silty sediment
CS2-SD128-PD	12/19/2006	1018	3.83	0.17	Yes	gray clay with some dark sand
CS2-SD129-PD	12/19/2006	1050	2.67	1.00	Yes	dark brownish black sand with some black silty sediment
CS2-SD130-PD	12/19/2006	1044	6.33	0.17	Yes	light brown milky clay
CS2-SD131-PD	12/19/2006	1036	6.50	0.17	No Recovery	Stones and gravel - no sediment
CS2-SD132-PD	12/19/2006	1028	2.67	0.42	Yes	dark gray clay mixed with some stones
CS2-SD133-PD	12/19/2006	1058	1.42	0.17	Yes	orange sand mixed with orange clay, some sediment mixed in
CS2-SD134-PD	12/19/2006	1107	4.00	0.25	Yes	brown and orange sand mixed, some brown sediment
CS2-SD135-PD	12/19/2006	1113	5.00	0.17	Yes	gray and orange clay mixed, some brown sediment
CS2-SD136-PD	12/19/2006	1120	1.92	0.58	Yes	black silt mixed with some black clay
CS2-SD137-PD	12/20/2006	0850	0.83	0.17	Yes	orangish brown organic material and roots mixed with some orange clay
CS2-SD138-PD	12/20/2006	0901	3.50	0.17	Yes	brown sand mixed with some orange clay and some gray clay
CS2-SD139-PD	12/20/2006	0906	3.92	0.50	Yes	brownish sand mixed some light brown clay
CS2-SD140-PD	12/20/2006	0912	2.92	0.33	Yes	brownish black fine sand with some clay
CS2-SD141-PD	12/20/2006	0938	1.58	0.33	Yes	brownish sand mixed with some clay and sediment
CS2-SD142-PD	12/20/2006	0933	3.25	0.33	Yes	brownish sand mixed with some clay and sediment
CS2-SD143-PD	12/20/2006	0927	4.00	0.33	Yes	course brown sand with traces of sediment
CS2-SD144-PD	12/20/2006	0924	2.42	0.42	Yes	brownish black sand with some dark sediment
CS2-SD145-PD	12/20/2006	0945	2.75	0.25	Yes	brown sand mixed with brown sediment
CS2-SD146-PD	12/20/2006	0952	3.75	0.25	Yes	orangish sand mixed with some orangish sediment and clay
CS2-SD147-PD	12/20/2006	0958	3.17	0.25	Yes	course brown sand with traces of sediment

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD148-PD	12/20/2006	1006	2.50	0.42	Yes	grayish black sediment mixed with some dark gray clay
CS2-SD149-PD	12/20/2006	1030	1.92	0.25	Yes	orangish brown sand and sediment with some small gravel
CS2-SD150-PD	12/20/2006	1024	4.33	0.50	Yes	brownish sand mixed with some small colored pebbles
CS2-SD151-PD	12/20/2006	1019	4.42	0.42	Yes	brownish sand mixed with some brown sediment and brown clay
CS2-SD152-PD	12/20/2006	1011	3.58	0.50	Yes	grayish clay with some dark sediment and some small colored gravel
CS2-SD153-PD	12/20/2006	1103	1.58	0.33	Yes	brown fine sand with silty sediment
CS2-SD154-PD	12/20/2006	1110	5.00	0.50	Yes	brown sand with some brown sediment and clay
CS2-SD155-PD	12/20/2006	1114	5.50	0.42	Yes	light brown sand and clay with some gravel
CS2-SD156-PD	12/20/2006	1120	2.83	0.08	Yes	gray clay with some gravel
CS2-SD157-PD	12/20/2006	1144	1.83	0.42	Yes	orangish brown sand with some brown sediment and clay
CS2-SD158-PD	12/20/2006	1139	5.00	0.50	Yes	brown sand with clay
CS2-SD159-PD	12/20/2006	1135	6.00	0.50	Yes	course brown sand with traces of sediment and gravel
CS2-SD160-PD	12/20/2006	1130	3.67	0.17	Yes	gray clay with some grayish silty sediment
CS2-SD161-PD	12/20/2006	1150	1.08	0.83	Yes	course brown sand
CS2-SD162-PD	12/20/2006	1154	3.42	0.33	Yes	course brown sand with some brown sediment and gravel
CS2-SD163-PD	12/20/2006	1202	5.42	0.17	Yes	brownish gray clay with gravel
CS2-SD164-PD	12/20/2006	1206	2.08	0.17	Yes	brownish clay with gravel
CS2-SD165-PD	12/20/2006	1212	2.42	0.83	Yes	orangish brown sand and clay mixed
CS2-SD166-PD	12/20/2006	1216	5.00	0.25	No Recovery	area covered with large stones - no sediment
CS2-SD167-PD	12/20/2006	1224	6.50	0.17	Yes	milky brown clay with some gravel
CS2-SD168-PD	12/20/2006	1230	3.25	0.33	Yes	grayish black clay with some brown silty sediment and gravel

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD169-PD	1/2/2007	1556	2.75	0.42	Yes	brown silty sediment mixed with some sand and vegetation
CS2-SD170-PD	1/3/2007	0920	5.00	0.50	Yes	light brown clay with some light brown sand and small gravel
CS2-SD171-PD	1/3/2007	0945	5.00	0.50	Yes	course brown sand with small gravel
CS2-SD172-PD	1/3/2007	0932	2.75	0.25	Yes	light brown clay with some light brown sand and small gravel
CS2-SD173-PD	1/5/2007	0905	3.50	0.17	Yes	brown clay with some sand, sediment and gravel
CS2-SD174-PD	1/5/2007	0857	4.33	0.25	Yes	brown sand and clay mixed with gravel
CS2-SD175-PD	1/5/2007	0850	5.24	0.17	Yes	brownish orange clay and gravel
CS2-SD176-PD	1/3/2007	0955	2.58	0.17	Yes	brown sand with some small gravel and brown sediment
CS2-SD177-PD	1/5/2007	0948	2.67	0.50	Yes	course brown sand with some gravel
CS2-SD178-PD	1/5/2007	0945	4.25	0.33	Yes	brown silty sediment with fine sand and gravel
CS2-SD179-PD	1/5/2007	0939	3.83	0.08	Yes	brown sand, clay and gravel
CS2-SD180-PD	1/5/2007	0939	3.00	0.00	No Recovery	rock
CS2-SD181-PD	1/8/2007	1555	3.42	0.67	Yes	dark brown fine sand with sediment
CS2-SD182-PD	1/8/2007	1548	5.25	0.25	Yes	orange clay mixed with some gravel and sand
CS2-SD183-PD	1/8/2007	1537	5.00	0.25	Yes	gravel with some brown sediment
CS2-SD184-PD	1/8/2007	1529	2.00	0.33	Yes	gravel with some brown sediment
CS2-SD185-PD	1/8/2007	1522	3.50	0.0	No Recovery	rock
CS2-SD186-PD	1/8/2007	1515	5.08	0.0	No Recovery	rock
CS2-SD187-PD	1/8/2007	1609	5.42	0.00	No Recovery	rock
CS2-SD188-PD	1/8/2007	1603	4.75	0.08	Yes	grayish clay with some gravel
CS2-SD189-PD	1/8/2007	1624	0.42	0.0	No Recovery	rock
CS2-SD190-PD	1/8/2007	1616	4.58	0.0	No Recovery	rock

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD191-PD	1/8/2007	1612	5.00	0.0	No Recovery	rock
CS2-SD192-PD	1/8/2007	1631	2.00	0.08	Yes	course brown sand with some gravel
CS2-SD193-PD	1/11/2007	0843	NA	NA	No Recovery	Current too strong in this area, sampling attempted twice
CS2-SD194-PD	1/11/2007	0843	NA	NA	No Recovery	Current too strong in this area, sampling attempted twice
CS2-SD195-PD	1/11/2007	0827	1.17	0.17	Yes	brown sand with lots of small gravel
CS2-SD196-PD	1/11/2007	0833	0.00	1.17	Yes	brown sand and sediment with small gravel
CS2-SD197-PD	1/11/2007	0856	NA	NA	No Recovery	Current too strong in this area, sampling attempted twice
CS2-SD198-PD	1/11/2007	0856	NA	NA	No Recovery	Current too strong in this area, sampling attempted twice
CS2-SD199-PD	1/11/2007	0853	1.92	1.00	Yes	brown sand and sediment with small gravel
CS2-SD200-PD	1/11/2007	0849	0.00	1.50	Yes	brown sand and sediment with small gravel
CS2-SD201-PD	1/11/2007	0924	2.17	0.67	Yes	brown sand and sediment with small gravel
CS2-SD202-PD	1/11/2007	0916	3.83	0.50	Yes	brown sand and sediment with small gravel
CS2-SD203-PD	1/11/2007	0907	3.50	0.75	Yes	brown sand and sediment with small gravel
CS2-SD204-PD	1/11/2007	0901	1.42	0.58	Yes	brown sand and sediment with small gravel
CS2-SD205-PD	1/23/2007	0841	1.92	0.00	No Recovery	rock
CS2-SD206-PD	1/23/2007	0847	3.00	0.08	Yes	light brown sediment and sand with lots of pebbles
CS2-SD207-PD	1/23/2007	0855	2.83	0.17	Yes	brown sediment and sand with lots of pebbles
CS2-SD208-PD	1/23/2007	0901	1.75	0.25	Yes	brown sediment and sand with lots of pebbles
CS2-SD209-PD	1/23/2007	0934	3.50	0.58	Yes	brown sediment and sand with lots of pebbles and shells
CS2-SD210-PD	1/23/2007	0924	3.92	0.00	Yes	light brown sediment and sand with lots of pebbles
CS2-SD211-PD	1/23/2007	0921	2.67	0.25	Yes	light brown sediment and some pebbles
CS2-SD212-PD	1/23/2007	0912	1.00	0.25	Yes	black sediment with some small gravel

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD213-PD	1/23/2007	0957	3.17	0.25	Yes	gray sediment with some sand and small gravel
CS2-SD214-PD	1/23/2007	1011	3.00	0.17	Yes	brown sand with small gravel and some sand
CS2-SD215-PD	1/23/2007	1017	3.00	0.17	Yes	small gravel with some brown sand and sediment
CS2-SD216-PD	1/23/2007	1033	0.42	0.58	Yes	brown sand and sediment with small gravel
CS2-SD217-PD	1/23/2007	1109	1.33	0.08	Yes	small gravel with some brown sand and sediment
CS2-SD218-PD	1/23/2007	1100	2.83	0.00	No Recovery	rock
CS2-SD219-PD	1/23/2007	1053	3.00	0.08	No Recovery	rock
CS2-SD220-PD	1/23/2007	1041	2.00	0.25	Yes	small gravel with some brown sand and sediment
CS2-SD221-PD	1/23/2007	1123	3.00	0.00	Yes	brown sand and sediment with small gravel
CS2-SD222-PD	1/23/2007	1131	3.08	0.25	Yes	colored sand with small gravel
CS2-SD223-PD	1/23/2007	1139	2.50	0.17	Yes	small gravel with some brown sand and sediment
CS2-SD224-PD	1/23/2007	1149	1.67	0.17	Yes	small gravel with some brown sand and sediment
CS2-SD225-PD	1/23/2007	1215	2.83	0.17	Yes	black organic sediment with some small gravel
CS2-SD226-PD	1/23/2007	1212	5.00	0.00	No Recovery	rock
CS2-SD227-PD	1/23/2007	1207	4.00	0.00	No Recovery	rock
CS2-SD228-PD	1/23/2007	1201	2.58	0.33	Yes	colored sand with small gravel
CS2-SD229-PD	1/24/2007	0835	3.75	0.00	Yes	light brown sand and sediment with some gravel
CS2-SD230-PD	1/24/2007	0841	3.92	0.25	Yes	light brown sand and sediment with some gravel
CS2-SD231-PD	1/24/2007	0846	1.92	0.08	Yes	light brown sand and sediment with some gravel
CS2-SD232-PD	1/24/2007	0852	1.00	0.33	Yes	gravel with some brown sediment and sand
CS2-SD233-PD	1/24/2007	0944	1.00	1.17	Yes	light brown sand, sediment and clay with some gravel
CS2-SD234-PD	1/24/2007	0936	2.50	0.08	Yes	light brown sand and sediment with some gravel

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD235-PD	1/24/2007	0928	1.00	0.08	Yes	gravel with some brown sediment and sand
CS2-SD236-PD	1/24/2007	0920	3.00	0.50	Yes	brown sand with some sediment and gravel
CS2-SD237-PD	1/24/2007	0954	1.67	0.33	Yes	brownish black sediment with some sand
CS2-SD238-PD	1/24/2007	1004	2.00	0.08	Yes	course colored sand with some gravel
CS2-SD239-PD	1/24/2007	1013	1.92	0.08	Yes	gravel with some brown sediment and sand
CS2-SD240-PD	1/24/2007	1022	3.58	0.17	Yes	brownish black sediment with some sand and gravel
CS2-SD241-PD	1/24/2007	1050	0.50	0.33	Yes	light brown sand, sediment and clay with some gravel
CS2-SD242-PD	1/24/2007	1044	2.50	0.08	No Recovery	rock
CS2-SD243-PD	1/24/2007	1038	4.50	0.00	Yes	light brown sand, sediment and clay with some gravel
CS2-SD244-PD	1/24/2007	1030	1.00	0.25	Yes	light brown sand, sediment and clay with some gravel
CS2-SD245-PD	1/24/2007	1101	2.08	1.00	Yes	brownish black sediment with some sand
CS2-SD246-PD	1/24/2007	1106	6.00	0.08	No Recovery	rock
CS2-SD247-PD	1/24/2007	1121	3.00	0.00	No Recovery	rock
CS2-SD248-PD	1/24/2007	1129	2.92	0.00	No Recovery	rock
CS2-SD249-PD	1/24/2007	1141	1.00	1.17	Yes	course colored sand with some gravel
CS2-SD250-PD	1/24/2007	1151	3.17	0.08	No Recovery	rock
CS2-SD251-PD	1/24/2007	1155	4.00	0.00	No Recovery	rock
CS2-SD252-PD	1/24/2007	1159	3.00	0.25	No Recovery	rock
CS2-SD253-PD	1/25/2007	0828	2.50	0.25	Yes	light brown sand, sediment and clay with some gravel
CS2-SD254-PD	1/25/2007	0839	3.00	0.08	No Recovery	rock
CS2-SD255-PD	1/25/2007	0850	5.83	0.00	No Recovery	rock
CS2-SD256-PD	1/25/2007	0854	1.67	1.33	Yes	light brown sand, sediment and clay with some gravel

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD257-PD	1/25/2007	0905	1.00	1.50	Yes	light brown sand, sediment and clay with some gravel
CS2-SD258-PD	1/25/2007	0944	3.50	0.17	No Recovery	rock
CS2-SD259-PD	1/25/2007	0933	5.58	0.00	No Recovery	rock
CS2-SD260-PD	1/25/2007	0940	2.00	0.25	Yes	light brown sand, sediment and clay with some gravel
CS2-SD261-PD	1/30/2007	1315	2.42	1.75	Yes	black organic sediment
CS2-SD262-PD	1/30/2007	1319	3.33	0.00	No Recovery	rock
CS2-SD263-PD	1/30/2007	1323	6.08	0.00	No Recovery	rock
CS2-SD264-PD	1/30/2007	1325	2.08	1.17	Yes	brown sediment mixed with gravel
CS2-SD265-PD	1/30/2007	1346	1.33	0.00	No Recovery	rock
CS2-SD266-PD	1/30/2007	1344	3.25	0.00	No Recovery	rock
CS2-SD267-PD	1/30/2007	1342	6.08	0.00	No Recovery	rock
CS2-SD268-PD	1/30/2007	1335	1.75	0.33	Yes	course colored sand with some brown sediment
CS2-SD269-PD	1/30/2007	1411	2.58	0.08	Yes	brown sediment with some gravel
CS2-SD270-PD	1/30/2007	1357	1.58	0.17	Yes	course colored sand and gravel
CS2-SD271-PD	12/7/2006	0947	1.33	0.08	No Recovery	area covered with large stones - no sediment
CS2-SD272-PD	12/7/2006	0937	0.00	NA - Frozen	Yes	brown, black and red sand with small gravel
CS2-SD273-PD	12/7/2006	1007	1.00	0.00	No Recovery	area covered with large stones - no sediment
CS2-SD274-PD	12/7/2006	1002	1.50	0.29	Yes	brownish sand with small gravel with some sediment
CS2-SD275-PD	12/7/2006	1000	0.92	0.25	Yes	some brown sediment mixed with brown sand
CS2-SD276-PD	12/7/2006	0954	2.00	0.00	No Recovery	area covered with large stones - no sediment
CS2-SD277-PD	1/30/2007	1455	1.42	0.50	Yes	brown sediment with some gravel

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD278-PD	12/7/2006	1355	1.29	0.25	Yes	brownish sand mixed with sediment, small gravel and leaves
CS2-SD279-PD	12/7/2006	1343	1.33	0.17	Yes	brown sand and sediment mixed with some gravel
CS2-SD280-PD	12/7/2006	1022	0.79	0.37	Yes	fine brown sand mixed with some brown sediment
CS2-SD281-PD	1/30/2007	1508	1.17	0.50	Yes	light brown sand with gravel
CS2-SD282-PD	12/7/2006	1415	0.75	0.04	Yes	small gravel with some brown sand and sediment
CS2-SD283-PD	12/7/2006	1408	1.00	0.08	Yes	small gravel with some brown sand and sediment
CS2-SD284-PD	1/30/2007	1515	0.92	0.92	Yes	brown sand and gravel mixed with some sediment
CS2-SD285-PD	1/31/2007	1314	0.42	0.42	Yes	brown sand with gravel and some sediment
CS2-SD286-PD	1/31/2007	1321	0.92	0.33	Yes	brown sand with gravel and some sediment
CS2-SD287-PD	1/31/2007	1326	1.17	0.42	Yes	course colored sand with small gravel
CS2-SD288-PD	1/31/2007	1331	2.08	0.42	Yes	course colored sand with small gravel
CS2-SD289-PD	1/31/2007	1357	1.33	0.50	Yes	brown clay with some sand, sediment and gravel
CS2-SD290-PD	1/31/2007	1351	3.42	0.08	Yes	course colored sand with small gravel
CS2-SD291-PD	1/31/2007	1345	5.00	0.17	No Recovery	rock
CS2-SD292-PD	1/31/2007	1337	3.17	0.83	Yes	brown clay with some sand, sediment and gravel
CS2-SD293-PD	1/31/2007	1405	0.58	0.17	Yes	course colored sand with small gravel
CS2-SD294-PD	1/31/2007	1410	2.42	0.17	Yes	course colored sand with small gravel
CS2-SD295-PD	1/31/2007	1419	3.08	0.17	Yes	brown clay with some sand, sediment and gravel
CS2-SD296-PD	1/31/2007	1428	2.83	0.25	Yes	brown clay with some sand, sediment and gravel
CS2-SD297-PD	1/31/2007	1443	0.42	0.17	Yes	course colored sand with small gravel
CS2-SD298-PD	1/31/2007	1448	0.08	0.25	Yes	brown clay with some sand, sediment and gravel
CS2-SD299-PD	1/31/2007	1451	0.33	0.08	Yes	course colored sand with small gravel

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD300-PD	1/31/2007	1500	1.50	0.17	Yes	brown clay with gravel
CS2-SD301-PD	1/31/2007	1507	0.08	0.33	Yes	brownish clay
CS2-SD302-PD	1/31/2007	1513	1.58	0.25	Yes	course colored sand with small gravel
CS2-SD303-PD	1/31/2007	1521	4.17	0.17	Yes	course colored sand with small gravel
CS2-SD304-PD	1/31/2007	1534	0.92	0.50	Yes	brown sediment with some sand and gravel
CS2-SD305-PD	1/31/2007	1556	0.42	0.17	Yes	brown sediment with some sand and gravel
CS2-SD306-PD	1/31/2007	1551	1.17	0.25	Yes	brown course sand and gravel
CS2-SD307-PD	1/31/2007	1547	0.67	0.33	Yes	brown course sand and gravel
CS2-SD308-PD	1/31/2007	1543	0.08	0.17	Yes	course colored sand with gravel
CS2-SD309-PD	1/31/2007	1606	0.25	0.08	Yes	brown sediment with some sand and gravel
CS2-SD310-PD	1/31/2007	1614	0.67	0.17	Yes	course colored sand with gravel and some sediment
CS2-SD311-PD	1/31/2007	1621	0.58	0.17	Yes	course colored sand with gravel and some sediment
CS2-SD312-PD	1/31/2007	1626	0.25	0.08	Yes	course colored sand with gravel
CS2-SD313-PD	1/31/2007	1648	0.50	0.08	Yes	brown clay and some small gravel
CS2-SD314-PD	1/31/2007	1642	2.58	0.17	Yes	course colored sand with gravel and some sediment
CS2-SD315-PD	1/31/2007	1637	1.50	0.17	Yes	course colored sand with gravel and some sediment
CS2-SD316-PD	1/31/2007	1632	0.25	0.08	Yes	course colored sand with gravel and some sediment
CS2-SD317-PD	2/1/2007	0920	1.25	0.25	Yes	brown clay with gravel
CS2-SD318-PD	2/1/2007	0924	3.25	0.08	Yes	brown clay with gravel
CS2-SD319-PD	2/1/2007	0928	1.25	0.17	Yes	brown clay with gravel
CS2-SD320-PD	2/1/2007	0932	0.17	0.08	Yes	brown clay with gravel
CS2-SD321-PD	2/1/2007	0951	1.25	0.17	Yes	brown clay

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD322-PD	2/1/2007	0946	4.25	0.67	Yes	brown clay with some gravel
CS2-SD323-PD	2/1/2007	0943	1.58	0.08	Yes	brown clay with some sand and gravel
CS2-SD324-PD	2/1/2007	0937	0.17	0.33	Yes	brown clay with some sand and gravel
CS2-SD325-PD	2/1/2007	0959	2.83	0.50	Yes	brown clay
CS2-SD326-PD	2/1/2007	1005	4.08	0.17	Yes	brown clay with gravel
CS2-SD327-PD	2/1/2007	1023	3.25	0.08	Yes	brown clay with gravel
CS2-SD328-PD	2/1/2007	1020	3.00	0.08	Yes	dark brown clay with gravel
CS2-SD329-PD	2/1/2007	1050	1.83	0.08	Yes	brown clay with gravel
CS2-SD330-PD	2/1/2007	1043	4.50	0.08	Yes	brown clay with gravel
CS2-SD331-PD	2/1/2007	1036	4.17	0.33	Yes	brown sand and gravel
CS2-SD332-PD	2/1/2007	1032	1.67	0.08	Yes	brown clay and gravel
CS2-SD333-PD	2/1/2007	1057	0.83	0.08	Yes	orangish brown clay with gravel
CS2-SD334-PD	2/1/2007	1102	4.33	0.25	Yes	orangish brown clay
CS2-SD335-PD	2/1/2007	1107	2.08	0.50	Yes	course colored sand with gravel
CS2-SD336-PD	2/1/2007	1110	1.08	0.25	Yes	course colored sand with gravel
CS2-SD337-PD	12/5/2006	1510	0.58	0.17	Yes	gravel with silty clay and some sediment
CS2-SD338-PD	12/5/2006	1505	1.83	0.33	Yes	gravel with brownish sand and some shells
CS2-SD339-PD	12/5/2006	1500	1.62	0.79	Yes	brownish sand
CS2-SD340-PD	12/5/2006	1445	0.50	0.12	Yes	gravel with sand and clay, some grass with small amount of sediment
CS2-SD341-PD	12/5/2006	1425	0.25	0.17	Yes	sand and sediment with leaves, grass, sticks and gravel
CS2-SD342-PD	12/5/2006	1400	1.50	0.42	Yes	brownish sand with sticks and shells

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD343-PD	12/5/2006	1408	1.17	0.67	Yes	brownish sand with shells and leaves
CS2-SD344-PD	12/5/2006	1419	0.50	0.17	Yes	rocks and small gravel with some sediment, clay and sand
CS2-SD345-PD	12/6/2006	1050	0.25	0.25	Yes	brownish sediment and sand mixed with some small gravel
CS2-SD346-PD	12/6/2006	1045	2.00	0.17	Yes	some brown sediment and clay with grasses and some gravel
CS2-SD347-PD	12/6/2006	1026	1.67	0.17	Yes	brown sand with shells, grasses and some gravel
CS2-SD348-PD	12/6/2006	1030	0.67	0.02	Yes	brownish sand and sediment mix with small gravel
CS2-SD349-PD	12/12/2006	0949	0.92	0.17	Yes	brown silty sediment w/ some sand
CS2-SD350-PD	12/12/2006	0958	2.12	0.17	Yes	brown sand with some sediment and small gravel
CS2-SD351-PD	12/12/2006	1016	1.92	0.17	Yes	brown silty sediment and sand mixed with some small gravel
CS2-SD352-PD	12/12/2006	1024	1.00	0.08	Yes	brown silty sediment mixed with some small gravel
CS2-SD353-PD	12/12/2006	1035	1.83	0.25	Yes	brown and black silty sediment mixed with some sand
CS2-SD354-PD	12/12/2006	1040	2.58	0.17	Yes	brown sediment and sand mixed with some small gravel
CS2-SD355-PD	12/12/2006	1043	1.92	0.17	Yes	brown sediment and sand mixed with some gravel
CS2-SD356-PD	12/12/2006	1053	2.17	0.08	Yes	dark brown/black silty sediment mixed with some small gravel
CS2-SD357-PD	12/6/2006	1200	0.71	0.21	Yes	brown and black sand with small gravel
CS2-SD358-PD	12/6/2006	1157	1.08	0.17	Yes	small gravel with shells and some sand
CS2-SD359-PD	12/6/2006	1149	1.00	0.17	Yes	small gravel with shells and some sand
CS2-SD360-PD	12/6/2006	1144	0.42	0.00	Yes	small gravel with shells and some sand
CS2-SD361-PD	12/12/2006	1403	1.25	0.29	Yes	brown silty sediment and sand mix
CS2-SD362-PD	12/12/2006	1410	1.42	0.17	Yes	brown sand mixed with some sediment and small gravel
CS2-SD363-PD	12/12/2006	1405	1.83	0.17	Yes	mix of brown sand and sediment with some small gravel
CS2-SD364-PD	12/12/2006	1357	1.21	0.04	Yes	brown silty sediment with some sand and small gravel

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD365-PD	12/12/2006	1418	1.42	0.12	Yes	black and brown sediment mixed with some small gravel
CS2-SD366-PD	12/12/2006	1421	1.83	0.25	Yes	orangish red sediment with some small gravel
CS2-SD367-PD	12/12/2006	1425	1.67	0.17	Yes	brown and black sediment mixed with some sand
CS2-SD368-PD	12/12/2006	1431	0.83	0.17	Yes	brown silty sediment with little sand
CS2-SD369-PD	12/12/2006	1440	1.33	0.17	Yes	brownish sediment and sand mixed, some small gravel
CS2-SD370-PD	12/12/2006	1444	1.58	0.12	Yes	brown sand with some silty sediment and small gravel
CS2-SD371-PD	12/12/2006	1448	1.42	0.25	Yes	brown sand with some gravel
CS2-SD372-PD	12/12/2006	1452	1.08	0.17	Yes	brown and black silty sediment with some sand
CS2-SD373-PD	12/13/2006	1023	1.17	0.17	Yes	brown sediment with some brown clay
CS2-SD374-PD	12/13/2006	1030	4.58	0.00	No Recovery	Stones and gravel - no sediment
CS2-SD375-PD	12/13/2006	1018	3.50	0.08	No Recovery	Stones and gravel - no sediment
CS2-SD376-PD	12/13/2006	1012	1.83	0.08	Yes	brownish sediment with some sand and brown clay
CS2-SD377-PD	12/14/2006	950	1.58	0.58	Yes	grayish black clay mixed with blackish sediment
CS2-SD378-PD	12/14/2006	1005	3.25	0.17	Yes	grayish black clay and sediment with some brown sand
CS2-SD379-PD	12/14/2006	1015	3.00	0.33	Yes	brown sand mixed with small colored pebbles
CS2-SD380-PD	12/13/2006	1035	1.58	0.42	Yes	brownish sediment with some sand and brown clay
CS2-SD381-PD	12/14/2006	1055	2.00	0.75	Yes	light and dark brown clay mixed with some brown sediment
CS2-SD382-PD	12/14/2006	1043	4.00	0.50	Yes	brown sand mixed with small colored pebbles
CS2-SD383-PD	12/14/2006	1035	4.00	0.25	Yes	brown sand mixed with small colored pebbles
CS2-SD384-PD	12/14/2006	1030	2.75	0.42	Yes	brown clay and sediment mixed with some brown sand
CS2-SD385-PD	12/18/2006	1350	2.42	0.04	Yes	black silty sediment
CS2-SD386-PD	12/14/2006	1117	4.50	0.08	Yes	brown sand mixed with small colored pebbles, some shells

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD387-PD	12/14/2006	1110	5.00	0.08	Yes	brown sand mixed some grayish clay
CS2-SD388-PD	12/14/2006	1105	1.67	0.21	Yes	brownish clay mixed with traces of brown sediment
CS2-SD389-PD	12/18/2006	1442	1.42	0.42	Yes	brown silty sediment mixed with some brown sand
CS2-SD390-PD	12/18/2006	1400	2.67	0.08	Yes	brown sand with some colored pebbles
CS2-SD391-PD	12/18/2006	1413	2.50	0.08	Yes	brown sand with some colored pebbles
CS2-SD392-PD	12/18/2006	1430	1.50	0.33	Yes	brown sand mixed with a small amount of brown sediment
CS2-SD393-PD	12/18/2006	1530	1.83	0.33	Yes	grayish black silty sediment mixed with some gray clay
CS2-SD394-PD	12/18/2006	1512	2.67	0.58	Yes	brown sand with small colored pebbles
CS2-SD395-PD	12/18/2006	1518	3.08	0.50	Yes	brown silty sediment and sand mixed, spots of blackish clay
CS2-SD396-PD	12/18/2006	1525	2.00	0.21	Yes	grayish black clay with some brown silty sediment
CS2-SD397-PD	12/18/2006	1454	1.75	0.67	Yes	grayish black silty sediment
CS2-SD398-PD	12/18/2006	1507	3.00	0.25	Yes	grayish clay with some brown sand
CS2-SD399-PD	12/18/2006	1500	2.58	0.17	Yes	brown sand with small gravel
CS2-SD400-PD	12/14/2006	1020	1.75	0.92	Yes	brownish clay mixed with traces of brown sediment
CS2-SD401-PD	1/10/2007	1253	3.67	0.83	Yes	course brown sand with some gravel
CS2-SD402-PD	1/10/2007	1300	3.92	0.67	Yes	course brown sand with some gravel
CS2-SD403-PD	1/10/2007	1313	1.00	0.75	Yes	brown silty sediment with some sand and small gravel
CS2-SD404-PD	1/10/2007	1306	3.00	1.42	Yes	ashy black sediment
CS2-SD405-PD	1/10/2007	1111	2.33	0.58	Yes	brown silty sediment with some sand and small gravel
CS2-SD406-PD	1/10/2007	1121	2.42	0.75	Yes	brown silty sediment with some sand and small gravel
CS2-SD407-PD	1/10/2007	1125	2.42	0.75	Yes	brown silty sediment with some sand and small gravel
CS2-SD408-PD	1/10/2007	1131	1.50	1.25	Yes	ashy black sediment

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD409-PD[a]	1/10/2007	1238	1.75	0.33	Yes	brown silty sediment with some sand and small gravel
CS2-SD410-PD[a]	1/10/2007	1226	2.58	0.08	Yes	brown silty sediment with some sand and small gravel
CS2-SD411-PD[a]	1/10/2007	1231	2.17	0.92	Yes	brown silty sediment with some sand and small gravel
CS2-SD412-PD[a]	1/10/2007	1146	1.58	0.50	Yes	brown silty sediment with some sand and small gravel
CS2-SD413-PD[a]	1/10/2007	1152	1.50	2.17	Yes	brown silty sediment with some sand and small gravel
CS2-SD414-PD[a]	1/10/2007	1212	2.33	0.25	Yes	brown silty sediment with some sand and small gravel
CS2-SD415-PD[a]	1/10/2007	1207	1.42	0.42	Yes	brown silty sediment with some sand and small gravel
CS2-SD416-PD[a]	1/10/2007	1158	1.58	1.00	Yes	dark brown silt with some sand and gravel
CS2-SD417-PD[a]	1/10/2007	1223	2.58	0.25	Yes	brown sand with some gravel
CS2-SD418-PD	3/8/2007	0920	0.33	0.67	Yes	brown sediment and sand with gravel
CS2-SD419-PD	3/8/2007	0929	0.50	0.67	Yes	brown sand mixed with sediment and some gravel
CS2-SD420-PD	3/8/2007	0938	2.00	0.50	Yes	colored sand and gravel
CS2-SD421-PD	3/8/2007	0950	2.00	0.50	Yes	brown sand with gravel
CS2-SD422-PD	3/8/2007	1000	3.00	0.50	Yes	brown sand with gravel
CS2-SD423-PD	3/8/2007	1018	4.00	0.50	Yes	brown sand with gravel
CS2-SD424-PD	3/14/2007	1323	1.08	1.00	Yes	black organic sediment
CS2-SD425-PD	3/14/2007	1328	4.50	0.00	No Recovery	rocks
CS2-SD426-PD	3/14/2007	1331	1.83	0.42	Yes	dark brown sediment mixed with some sand and gravel
CS2-SD427-PD	3/15/2007	0900	3.00	2.42	Yes	black sediment mixed with some sand and gravel
CS2-SD428-PD	3/15/2007	0925	7.33	0.08	No Recovery	rocks
CS2-SD429-PD	3/15/2007	0911	6.17	0.04	Yes	grayish clay mixed with gravel
CS2-SD430-PD	3/15/2007	0931	4.50	1.83	Yes	orangish sand with some sediment

Sample ID	Date Sampled	Time Sampled	Water Depth (ft)	Sediment Depth (ft)	Sediment Recovered	Sediment Description
CS2-SD431-PD	3/15/2007	0936	7.25	0.08	No Recovery	rocks
CS2-SD432-PD	4/17/2007	1515	4.58	0.33	Yes	some sediment mixed with brownish clay
CS2-SD433-PD	4/18/2007	1000	2.33	0.25	Yes	brownish clay with gravel
CS2-SD434-PD	4/18/2007	1005	3.67	0.50	Yes	brownish clay with gravel
CS2-SD435-PD	4/18/2007	1011	2.58	1.17	Yes	brownish clay with gravel
CS2-SD436-PD	3/14/2007	1419	2.75	0.50	Yes	black organic sediment

[a] Samples analyzed for PCBs only, taken from Kokomo Creek

Appendix B
Kokomo Creek Poling Data

APPENDIX B

Kokomo Creek Poling Data

Poling ID	Date	Water Depth (ft)	Sediment Depth (ft)	Description
1-K	1/4/07	2.75	0.50	Sand and sediment
2-K	1/4/07	0.17	1.17	Sand
3-K	1/4/07	1.50	0.08	Sand with some sediment
4-K	1/4/07	0.92	0.42	Sand/Clay/Sediment
5-K	1/4/07	0.58	1.42	Sand with small gravel and shells
6-K	1/4/07	1.25	0.08	Sand
7-K	1/4/07	1.08	0.08	Sand
8-K	1/4/07	1.42	0.08	Sand
9-K	1/4/07	0.42	0.83	Sand
10-K	1/4/07	0.25	0.25	Clay
11-K	1/4/07	2.17	0.42	Sand with large gravel
12-K	1/4/07	0.75	1.08	Sand, clay and large stones
13-K	1/4/07	0.75	0.25	Sand and lots of small gravel
14-K	1/4/07	2.08	0.17	Sand and gravel
15-K	1/4/07	0.58	0.42	Sand and gravel
16-K	1/4/07	2.17	0.08	Sand and gravel, some concrete blocks
17-K	1/4/07	2.00	0.08	Sand and concrete blocks/large stones
18-K	1/4/07	1.33	0.17	Sand and concrete blocks/large stones
19-K	1/4/07	1.42	0.17	Sand and large stones
20-K	1/4/07	1.62	0.04	Sand and large stones
21-K	1/4/07	0.08	0.04	Sand, gravel and stone
22-K	1/4/07	1.17	0.04	Sand and large stones
23-K	1/4/07	2.50	0.17	Sand and gravel, large boulder in this area
24-K	1/4/07	0.08	0.12	Sand, gravel and stone
25-K	1/4/07	0.92	0.04	Sand, gravel and stone, large boulder in this area
26-K	1/4/07	2.08	0.33	Sand and gravel
27-K	1/4/07	1.17	0.08	Sand and gravel
28-K	1/4/07	1.00	0.21	Sand and sediment, large boulder in this area

Poling ID	Date	Water Depth (ft)	Sediment Depth (ft)	Description
1-K	1/4/07	2.75	0.50	Sand and sediment
2-K	1/4/07	0.17	1.17	Sand
29-K	1/4/07	2.75	0.17	Sand with gravel and large stones
30-K	1/4/07	0.83	0.08	Gravel, sand and large stones
31-K	1/4/07	1.12	1.83	Dark brown sediment and some stone
32-K	1/4/07	2.83	0.12	Sand and gravel
33-K	1/10/07	3.00	0.00	Large stones - no sediment
34-K	1/10/07	3.08	0.37	Sand and gravel
35-K	1/10/07	1.58	0.42	Sand
36-K	1/10/07	1.75	0.29	Large stones
37-K	1/10/07	0.92	0.08	Sand and small gravel, area filled with large stones
38-K	1/10/07	1.08	0.00	Large stones
39-K	1/10/07	0.75	0.25	Sand, large stones and other rubbish
40-K	1/10/07	0.92	0.08	Sand and large stones
41-K	1/10/07	0.29	0.00	Large stones
42-K	1/10/07	2.67	0.29	Sand and small gravel, area filled with large stones
43-K	1/10/07	2.50	0.08	Sand
44-K	1/10/07	2.17	0.33	Sediment and sand
45-K	1/10/07	3.17	0.33	Sand
46-K	1/10/07	4.00	0.67	Sand and gravel
47-K	1/10/07	2.83	1.00	Gravel and sand
48-K	1/10/07	2.50	1.25	Black sediment and sand
49-K	1/10/07	3.58	0.17	Gravel
50-K	1/10/07	2.92	2.17	Black sediment and sand
51-K	1/10/07	2.58	0.50	Gravel
52-K	1/10/07	2.83	0.50	Gravel and sand
53-K	1/10/07	2.17	1.83	Black sediment and gravel
54-K	1/10/07	0.92	1.83	Black sediment
55-K	1/10/07	2.33	0.92	Sand and gravel, large stones
56-K	1/10/07	2.92	0.17	Gravel
57-K	1/10/07	2.50	0.25	Sand and gravel
58-K	1/10/07	3.83	0.33	Sand and gravel

Poling ID	Date	Water Depth (ft)	Sediment Depth (ft)	Description
1-K	1/4/07	2.75	0.50	Sand and sediment
2-K	1/4/07	0.17	1.17	Sand
59-K	1/10/07	2.58	1.58	Gravel, sand and sediment
60-K	1/10/07	2.83	0.42	Sand and gravel
61-K	1/10/07	1.50	2.33	Sediment, large concrete pieces
62-K	1/10/07	3.58	0.75	Sand and gravel
63-K	1/10/07	2.00	0.33	Rock
64-K	1/10/07	3.08	1.00	Sand
65-K	1/10/07	3.17	0.17	Sand and gravel
66-K	1/10/07	2.08	0.50	Sand and gravel
67-K	1/10/07	4.17	0.67	Sand and gravel
68-K	1/10/07	3.33	1.25	Sand and gravel
69-K	1/10/07	1.50	0.58	Sand and gravel
70-K	1/10/07	1.25	1.17	Sand and clay
71-K	1/10/07	3.58	0.58	Sand and gravel
72-K	1/10/07	2.83	0.67	Sand and gravel
73-K	1/10/07	2.92	0.50	Sand, stone and sediment, trees in creek
74-K	1/10/07	3.00	1.08	Sand and stones
75-K	1/10/07	2.67	0.08	Sand and stones
76-K	1/10/07	1.08	0.17	Sand and large stones
77-K	1/10/07	2.00	0.08	Gravel and rocks
78-K	1/10/07	2.08	0.58	Sand and rocks
79-K	1/10/07	1.92	1.08	Sand and gravel
80-K	1/10/07	2.42	0.17	Sand, gravel and rocks
81-K	1/10/07	1.50	0.58	Sand, gravel and rocks
82-K	1/10/07	NA	NA	Large fallen tree
83-K	1/10/07	1.75	0.33	Sediment with some sand and small gravel
84-K	1/10/07	2.58	0.08	Sediment with some sand and small gravel
85-K	1/10/07	2.17	0.92	Sediment with some sand and small gravel
86-K	1/10/07	1.58	0.50	Sediment with some sand and small gravel
87-K	1/10/07	1.50	2.17	Sediment with some sand and small gravel
88-K	1/10/07	2.33	0.25	Sediment with some sand and small gravel
89-K	1/10/07	1.42	0.42	Sediment with some sand and small gravel

Poling ID	Date	Water Depth (ft)	Sediment Depth (ft)	Description
1-K	1/4/07	2.75	0.50	Sand and sediment
2-K	1/4/07	0.17	1.17	Sand
90-K	1/10/07	1.58	1.00	Sediment with some sand and gravel
91-K	1/10/07	2.58	0.25	Sand with some gravel
92-K	1/10/07	3.67	0.83	Sand with some gravel
93-K	1/10/07	3.92	0.67	Sand with some gravel
94-K	1/10/07	1.00	0.75	Sediment with some sand and small gravel
95-K	1/10/07	3.00	1.42	Soft sediment
96-K	1/10/07	2.33	0.58	Sediment with some sand and small gravel
97-K	1/10/07	2.42	0.75	Sediment with some sand and small gravel
98-K	1/10/07	2.42	0.75	Sediment with some sand and small gravel
99-K	1/10/07	1.50	1.25	Soft sediment

APPENDIX D

Technical Memorandum, Wildcat and Kokomo Creeks (OU3) SWAC Evaluation
Continental Steel Superfund Site
Kokomo, Indiana

Wildcat and Kokomo Creeks (OU3) SWAC Evaluation Continental Steel Superfund Site Kokomo, Indiana

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DATE: Revised June 14, 2007

Introduction

This memorandum summarizes the evaluation of surface weighted average concentrations (SWAC) using the 2006/2007 pre-construction data collected in sediments from within Wildcat and Kokomo Creeks (OU-3) at the Continental Steel Superfund Site (CSSS).

Pre-construction data collection activities were conducted in 2006 and 2007 in order to provide recent contaminant and sediment thickness data for delineating the required dredge areas and estimating removal volumes within OU-3. Data collection and evaluation activities are summarized in *Data Evaluation Summary Report, 2006/2007 Pre-construction Sediment Investigation (CH2M HILL, May 2007).*

Using the 2006/2007 data, dredge areas for OU-3 were determined based on the remedial design/remedial action (RD/RA) cleanup goals, as summarized in Table 1. The cleanup goals were based on removing 3 times the Remediation Goal (RG) for polychlorinated biphenyls (PCBs) and 5 times the RG for polynuclear aromatic hydrocarbons (PAHs). Select locations were also identified for removal based on elevated arsenic levels. The proposed dredge area is contained in *Data Evaluation Summary Report, 2006/2007 Pre-construction Sediment Investigation (CH2M HILL, May 2007).* Using the dredge area and sediment thickness measurements collected in 2006/2007, the volume of sediments to be removed during RA activities is estimated to be approximately 7,050 cubic yards.

Table 1
Cleanup Goals for Sediment in Wildcat and Kokomo Creeks
Continental Steel Superfund Site

Chemical	Final Remediation Goal (mg/kg)	Cleanup Goal (mg/kg)
Aroclor-1016	1.0	3.0
Aroclor-1242	1.0	3.0
Aroclor-1248	1.0	3.0
Aroclor-1254	1.0	3.0
Aroclor-1260	1.0	3.0
Benzo(a)anthracene	1.853	9.265

Benzo(a)pyrene	1.585	7.925
Benzo(b&k)fluoranthene	1.361	6.805
Indeno(1,2,3-cd)pyrene	0.93	4.65
Arsenic	19.0	19.0
Beryllium	0.84	0.84

Surface Weighted Average Approach and Methodology

The SWAC method is an approach which is commonly used to determine the average concentration of a contaminant for a particular length and/or area of a water body. For the sediments in Wildcat and Kokomo Creeks, the SWAC approach was used to examine the effectiveness of sediment removal activities.

The basis of the SWAC approach is that the exposure domain for receptors is broader than the small areas represented by individual samples, and so an average concentration of the exposure domain should be used. This application of the SWAC methodology to the sediment in Wildcat and Kokomo Creeks was determined based on the overall creek system as well as in the six individual reaches (Figure 1).

The methodology used is listed below:

1. Each sediment location was assigned an identifier such that a SWAC could be calculated.
2. The estimated area of river bottom to be assigned to each sediment location (consisting of either a composite sediment core or a sediment grab sample) was determined based on polygonal declustering. This method divides the total area of influence into polygons, one for each location, with the area of the polygon representing the relative weighting of that sample. The polygons of influence, or Theissen polygons, are drawn using a GIS tool, such that a polygon contains all the area that is closer to a given sample point than to any other sample point.
3. Upon defining the Theissen polygons for each sediment sample location, the weighted concentration for each polygon (Cw_i) was calculated by multiplying the concentration (C_i) by the area (A_i), or:

$$Cw_i = C_i \times A_i$$

4. The products of the sediment concentrations and surface areas were summed and the total divided by the total surface area for the creek (or individual reaches) to get a SWAC for the overall creek system (or individual reaches), or:

$$SWAC_{creek} = \frac{\sum_{i=1}^{n} Cw_i}{A_{creek}}$$

The methodology requires that each polygon area be assigned a representative sediment concentration. If a duplicate sample was collected at the location, only the native sample

result was used to assign a concentration value. If the result was not detected, one-half the quantitation limit was used.

The SWAC approach was used for evaluating total PCBs, individual PAHs, beryllium, and arsenic. The SWACs for the individual PCB Aroclors were not calculated. It should be noted that the remediation goals are for the individual PCB Aroclors rather than a total PCB concentration, therefore the SWAC analysis using total PCBs is a conservative approach.

Three different SWACs were calculated for the overall creek system as well as the six individual reaches. The SWAC was calculated for pre-dredge (i.e., pre-construction or existing), immediate post-dredge, and long-term post-dredge conditions.

The concentration (C_i) used for calculating the SWAC is dependent on the SWAC being calculated, as defined below.

- For calculating the pre-dredge SWAC, the concentration assigned is the contaminant concentration determined during the 2006/2007 pre-construction sampling. For locations where no sediment was encountered during pre-construction sampling activities, a value of 0 was assigned as the concentration.
- For calculating the immediate post-dredge SWAC, each sediment location was delineated as either within the dredge area or outside of the dredge area. For sediment locations outside of the dredge area, the concentration assigned is the contaminant concentration determined during the 2006/2007 pre-construction sampling (i.e., assumed that the concentration does not change). For sediment locations within the dredge area, the concentration assigned to that location following dredging is one-half the quantitation limit. For locations where no sediment was encountered during pre-construction sampling activities, a value of 0 was again assigned as the concentration for SWAC calculations.
- For calculating the long-term post-dredge SWAC, sediment locations outside of the dredge area were assigned the contaminant concentration determined during the 2006/2007 pre-construction sampling (i.e., assumed that the concentration does not change). For sediment locations within the dredge area, the concentration assigned to that location to calculate the long-term post-dredge SWAC is based on the re-evaluated background concentration (see discussion below). For locations where no sediment was encountered during pre-construction sampling activities, a value of 0 was again assigned as the concentration for SWAC calculations (assuming that the area is not a depositional area).

For calculating the long-term post-dredge SWAC, it was assumed that sediment locations which contained sediment and are proposed to be dredged are depositional and that sediment will be transported from upstream and settle into the dredged areas. The sediment deposition concentration value which was used was based on the re-evaluation of background concentration values which were developed using data collected in 2001 (CH2M HILL 2002). Separate background concentrations were calculated for each creek. The results of the reevaluation of the background concentrations are summarized in Table 2. For locations downstream of the confluence of Kokomo and Wildcat Creeks, a conservative value was used of the maximum of the Kokomo and Wildcat Creek background concentration. Note that the assumption that sediment from upstream will settle into the

dredged areas was used for the purposes of calculating the long-term post-dredge SWAC. It is possible sediments currently within the creeks system may also deposit in dredged areas.

Table 2
Re-evaluated Background Concentrations for Sediment in Wildcat and Kokomo Creeks
Continental Steel Superfund Site

Chemical	Re-evaluated Background (mg/kg)	
	Kokomo Creek	Wildcat Creek
Arsenic	7.0	32.3
Beryllium	0.72	0.58
Benzo(a)anthracene	7.1	0.915
Benzo(a)pyrene	4.849	0.881
Benzo(b&k)fluoranthene	12.046	1.71
Indeno(1,2,3-cd)pyrene	3.48	0.875
Aroclor-1016	0.24	0.42
Aroclor-1242	0.12	0.21
Aroclor-1248	0.937	0.21
Aroclor-1254	0.12	0.37
Aroclor-1260	0.25	0.21

The calculated SWACs for the overall creek and the individual reaches for each contaminant of interest are summarized in Table 3.

Discussion

The SWAC approach was used to evaluate the overall effectiveness of potential removal actions on the creek environment. A theoretical post-remediation SWAC for the overall creek system, as well as individual reaches within the creeks, was calculated following removal action activities. The effectiveness of the action could then be assessed by comparing the pre- and post-remedial conditions, based on the changes in the calculated SWAC or estimated percent mass reduction for the entire creek. Table 3 shows that all calculated immediate post-dredging SWAC values meet the final remediation goals for the overall creek system as well as for all of the individual reaches. Each of the individual contaminants of concern is discussed below.

- The SWAC for **total PCBs** decreased from nearly 4 parts per million (ppm, or milligrams per kilogram [mg/kg]) to 0.63 ppm immediately after dredging for the overall creek system. The long-term post-dredge SWAC for total PCBs was estimated to be 0.72 ppm. Both the immediate and long-term post-dredge SWAC concentrations for PCBs were below the final remediation goal for PCBs of 1.0 ppm.
- As shown in Table 3, all pre-dredge SWAC concentrations for the five **PAHs** of interest are currently less than the final remediation goal for the overall creek. The SWAC

concentrations decrease to well below the final remediation goals immediately following dredging. Note that all SWAC concentrations are estimated to increase in the long-term. Two of the five PAHs (benzo[b]fluoranthene and benzo[k]fluoranthene) are estimated to increase to above their final remediation goals in the long-term. One of the reasons for this significant increase in the long-term SWAC concentration for the PAHs are the high background concentrations used in calculating the long-term SWAC, with the assumption that the dredged areas will be re-deposited by sediment from upstream.

- Even though dredge areas were delineated primarily based on PCBs and PAHs, not arsenic and beryllium, the SWAC methods were also applied to **arsenic** and **beryllium** to determine the effectiveness of the removal actions to lower the concentrations of these metals in the creek sediments. The final remediation goal for arsenic and beryllium is 19 and 0.84 ppm, respectively. Based on the SWAC calculation, the pre-dredge, immediate post-dredge, and long-term post-dredge SWACs were all below their respective remediation goals.

- The creeks were divided into six reaches, and the boundaries for each reach were delineated within the GIS database (Figure 1). The reach representing Shambaugh Run (Reach 8) was not evaluated in the SWAC evaluation. The SWAC was also calculated for each of the individual reaches in addition to the overall creek. The calculated SWAC values for each of the individual reaches are summarized in Table 3.

As stated above, the dredge areas were delineated primarily based on PCBs and PAHs. Additional dredge areas were also added to remove select locations containing elevated levels of arsenic. It was estimated that removing the delineated dredge areas will reduce the overall mass of arsenic in the creek sediments by approximately 55 percent.

Table 3
Wildcat and Kokomo Creeks (OU3)
Continental Steel Superfund Site
Surface Weighted Average Concentration (SWAC) Analysis

	PCBs	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Ideno(1,2,3-cd)pyrene	Arsenic	Beryllium
Entire Project Area (Reaches 1 through 6)								
Pre-dredge SWAC	3.88	0.93	0.79	1.08	0.51	0.48	9.43	0.50
Immediate Post-dredge SWAC[1]	0.63	0.54	0.44	0.52	0.34	0.34	6.12	0.43
Long-term Post-dredge SWAC[2]	0.72	1.73	1.25	2.60	2.43	0.91	11.5	0.53
Reach 1								
Pre-dredge SWAC	2.81	0.46	0.39	0.43	0.37	0.36	8.35	0.82
Immediate Post-dredge SWAC[1]	0.83	0.45	0.39	0.41	0.36	0.35	6.21	0.83
Long-term Post-dredge SWAC[2]	0.93	1.55	1.12	2.33	2.27	0.87	11.4	0.91
Reach 2								
Pre-dredge SWAC	2.80	0.95	0.92	1.61	0.69	0.38	9.18	0.80
Immediate Post-dredge SWAC[1]	0.52	0.45	0.35	0.44	0.28	0.29	4.22	0.49
Long-term Post-dredge SWAC[2]	0.64	1.77	1.23	2.73	2.57	0.91	10.4	0.58
Reach 3								
Pre-dredge SWAC	2.51	0.79	0.64	0.76	0.44	0.46	8.95	0.53
Immediate Post-dredge SWAC[1]	0.97	0.39	0.37	0.38	0.34	0.34	7.10	0.47
Long-term Post-dredge SWAC[2]	1.07	1.61	1.18	2.49	2.44	0.90	13.0	0.56
Reach 4								
Pre-dredge SWAC	17.89	2.21	2.02	2.99	0.99	1.14	3.84	0.27
Immediate Post-dredge SWAC[1]	0.36	0.42	0.44	0.55	0.36	0.34	1.06	0.23
Long-term Post-dredge SWAC[2]	0.83	5.59	3.88	9.48	9.29	2.74	6.02	0.59
Reach 5								
Pre-dredge SWAC	3.25	1.08	0.89	1.01	0.45	0.44	18.2	0.39
Immediate Post-dredge SWAC[1]	0.41	0.77	0.59	0.59	0.33	0.34	9.58	0.33
Long-term Post-dredge SWAC[2]	0.38	0.94	0.75	1.00	0.74	0.50	19.1	0.43
Reach 6								
Pre-dredge SWAC	0.42	0.73	0.52	0.77	0.39	0.37	5.36	0.10
Immediate Post-dredge SWAC[1]	0.42	0.73	0.52	0.77	0.39	0.37	5.36	0.10
Long-term Post-dredge SWAC[2]	0.42	0.73	0.52	0.77	0.39	0.37	5.36	0.10

Notes:

All units in mg/kg (parts per million [ppm])

PCBs - polychlorinated biphenyls

SWAC - surface weighted average concentration
[1] Post-dredge concentrations calculated by assigning a value of 1/2 the quantitation limit to dredged areas
[2] Post-dredge concentrations calculated by assigning the background concentration to dredged areas

N

250 0 250 500 Feet

Wildcat Creek

1

Shambaugh Run

8

2

6

Wildcat Creek

5

3

Wildcat Creek

Kokomo Creek

4

LEGEND

STREAM REACH DELIMITERS

4 STREAM REACH DESIGNATION

FIGURE 1
Wildcat and Kokomo Creeks
Reach Designations
Continental Steel Superfund Site

CH2MHILL

\\hercules\Pro\continental steel\gis\to be archived\ce-sta_lock.apr (Wildcat and Kokomo Creek Stream Reach Designations (11x17) Layout.PDF) 03 Sep 2003 9:59 MPETERSHMKE

Wildcat and Kokomo Creeks (OU3)
Continental Steel Superfund Site
Surface Weighted Average Concentration (SWAC) Analysis

	PCBs	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Ideno(1,2,3-cd)pyrene	Arsenic	Beryllium
Entire Project Area (Reaches 1 through 6)								
Pre-dredge SWAC	3.88	0.93	0.79	1.08	0.51	0.48	9.43	0.50
Immediate Post-dredge SWAC[1]	0.63	0.54	0.44	0.52	0.34	0.34	6.12	0.43
Long-term Post-dredge SWAC[2]	0.72	1.73	1.25	2.60	2.43	0.91	11.5	0.53
Reach 1								
Pre-dredge SWAC	2.81	0.46	0.39	0.43	0.37	0.36	8.35	0.82
Immediate Post-dredge SWAC[1]	0.83	0.45	0.39	0.41	0.36	0.35	6.21	0.83
Long-term Post-dredge SWAC[2]	0.93	1.55	1.12	2.33	2.27	0.87	11.4	0.91
Reach 2								
Pre-dredge SWAC	2.80	0.95	0.92	1.61	0.69	0.38	9.18	0.80
Immediate Post-dredge SWAC[1]	0.52	0.45	0.35	0.44	0.28	0.29	4.22	0.49
Long-term Post-dredge SWAC[2]	0.64	1.77	1.23	2.73	2.57	0.91	10.4	0.58
Reach 3								
Pre-dredge SWAC	2.51	0.79	0.64	0.76	0.44	0.46	8.95	0.53
Immediate Post-dredge SWAC[1]	0.97	0.39	0.37	0.38	0.34	0.34	7.10	0.47
Long-term Post-dredge SWAC[2]	1.07	1.61	1.18	2.49	2.44	0.90	13.0	0.56
Reach 4								
Pre-dredge SWAC	17.89	2.21	2.02	2.99	0.99	1.14	3.84	0.27
Immediate Post-dredge SWAC[1]	0.36	0.42	0.44	0.55	0.36	0.34	1.06	0.23
Long-term Post-dredge SWAC[2]	0.83	5.59	3.88	9.48	9.29	2.74	6.02	0.59
Reach 5								
Pre-dredge SWAC	3.25	1.08	0.89	1.01	0.45	0.44	18.2	0.39
Immediate Post-dredge SWAC[1]	0.41	0.77	0.59	0.59	0.33	0.34	9.58	0.33
Long-term Post-dredge SWAC[2]	0.38	0.94	0.75	1.00	0.74	0.50	19.1	0.43
Reach 6								
Pre-dredge SWAC	0.42	0.73	0.52	0.77	0.39	0.37	5.36	0.10
Immediate Post-dredge SWAC[1]	0.42	0.73	0.52	0.77	0.39	0.37	5.36	0.10
Long-term Post-dredge SWAC[2]	0.42	0.73	0.52	0.77	0.39	0.37	5.36	0.10

Notes:
All units in mg/kg (parts per million [ppm])
PCBs - polychlorinated biphenyls
SWAC - surface weighted average concentration
[1] Post-dredge concentrations calculated by assigning a value of 1/2 the quantitation limit to dredged areas
[2] Post-dredge concentrations calculated by assigning the background concentration to dredged areas